PSYCHE

OCTOBER, 1924

EDITORIAL

DIN

It would be interesting to know by what processes, mental or statistical, those whose business it is to determine what is generally known as the " psychological moment " for the launching or the desertion of a movement, a campaign, or an exposure, set about their business. At times it is very mysterious, this apparent certainty. Disestablishment or Secular Education will be allowed by the experts at a certain moment (say) ten years, before it again can be taken down from the shelf. Continuation Schools or Land Taxes are at one moment regarded as a foregone conclusion, at the next as dead for a generation at least : a Channel Tunnel or the Obviation of Premature Burial relapses into oblivion for seven years : Diabolo, Psycho-analysis, Standard Bread, Einstein, or Ectoplasm vanish from the shop windows as quickly as they arrived. We have our own views about the mystery, but while it remains, the discerning person will continue to time his arrival by the crest of the wave, and will advise his friends to scan the horizon for such stars as permit of wagons being hitched to them.

The Psychologist, who might have given the world a lead in this matter of exchanging horses before mid-stream, has been hardly more successful than has the Economist on the Stock Exchange. Fifty years ago the catchword was Mental Science—" Clear Ideas for all "—but the metaphysicians adroitly stole his thunder. Thirty years ago Hypnotism offered possibilities ; but the psychologist was too sedentary to perfect his technique—and the physician mounted the wave. Twenty years ago Fatigue came to the front, and the psychologist entering the arena from his newly-erected laboratory five years too late neglected to vacate it when the economic situation should have warned him to do so. Ten years ago Intelligence Tests offered him a clear run up the educational ladder, but he played about on the lower rungs and the test became a toy. Meanwhile (Wave-length 606, Vienna Calling) Sex is seen to be a seller—but not by the psychologist, until the market is already overstocked by amateur studies of the anal-erotic schizophrene.

And what next? No doubt there are some who would congratulate the psychologist on his inability to make good in the mundane world. Let him get on quietly with his research and study the mind, soul, brain, psyche—or whatever it is he does study; say these disinterested persons. Such a view may come well enough from the deep thinker, or from the recluse well entrenched behind endowments; and is rightly applied to some psychologists. But for the clear thinker and the humanist, psychology as a developing science must do something to secure a living. We must remember that it is not even fully recognised at the Universities. Oxford has no Chair of Psychology: nor has Cambridge: no psychological journal in Great Britain has yet attained a circulation of 1,000: no publisher can be found who dare undertake the translation of the standard works of Lipps, Maier, Meinong, Binet, and Janet, which have been acclaimed as classics throughout the rest of Europe: and it is a commonplace abroad that no really *original* work on psychology has appeared in the English (as distinct from the American) language for at least a decade—Shand's *Foundations of Character* being apparently the last publication to merit this description.

It is then our duty to discover from time to time themes such as the Sunday Papers deem it expedient to ventilate, and to ventilate them as psychologists, from the psychological point of view, in the interests of the public—and, if possible, of the nation and of humanity at large. Someone may then say, "We owe that to psychology: there may be something in it," or, "Let us pass a law to secure more psychologists": or even, "Let us buy *Psyche*."

The moment is opportune. For there is a subject eminently suited to psychological treatment which is at the moment distinctly in the wind, and is likely to receive continued attention throughout 1925. We refer to the problem of NOISE. Before us lie the Sunday Papers themselves, under date September 14, 1924. It is Mr. E. V. Lucas speaking, in the *Sunday Times*—a whole column entirely devoted to Noise: "Never," he says, "were the conditions of life in our cities and on high-roads so discordant and nerve-shattering." We turn to the *Sunday Pictorial*, and there is Mr. Valentine Williams (portrait inset) with a heading across half the page, "Perpetual Noise a Menace to Health," demanding an international conference to consider this unnecessary erosion of our nervous strength, and to "rescue the coming generation from chronic neurasthenia." Mr. Williams even goes so far as to invoke the aid of science: "Medical men are agreed that the nervous disorders

which are the bane of the age are fostered and increased, if not directly induced, by the deafening din in which town dwellers of to-day are compelled to live." He points out that the problem is scarcely twenty years old, and he confines himself to the traffic problem :

> " There are many noises in the cities of to-day, but the din of the motor traffic is the worst, both from the point of view of volume and the effect on the nerves. And yet it is the most easily dealt with.
>
> The law protects the householder against manifold nuisances, against smoke, and dust, and bad odours. Then why not against the massacre of nerves by noise ?
>
> As far as I am aware I am at liberty, if I so wish, to load up an ancient and ramshackle lorry with tin cans, loosely chained together, with a large stone in each, and drive this ghastly noise-machine with impunity up and down the streets. If I leave the engine of my car running for ten minutes or so, or blow my horn indefinitely in a quiet suburban thoroughfare, a policeman, if there happen to be one about, will check me."

So recently as September 29 we find Sir Lenthal Cheatle writing to the *Times* from 117, Harley Street : " I am sure the noise of whirling machinery in our streets, and the variety and penetrating intensity of blasts, hoots, and croaks emitted from horns, are very bad for all of us. With careful driving most of the motor-horn emissions are quite unnecessary. A driver's examination before receiving a licence could be made to include the proper uses of a horn. I live in a corner house. . . . Often the approach of a solitary car is announced by four or more shrieks that impinge on the ears of only those people who dwell in corner houses."

Mr. Lucas also has taken note of the motor fiend, " the bank clerk who now dashes through English villages on an explosive motor-bicycle at fifty miles an hour—one of the commonest objects of our latter-day country-side." But he can tell of noisier inventions : " A motor-bicycle with internal trouble can be the second noisiest thing that I know ; the noisiest is an aeroplane with a propeller on each side. Passengers in the cars of such machines have cotton-wool served out to them to break the shock ; but it does little enough. On the only occasion on which I have entrusted my existence to the air—coming from Paris to London—all communication had to be made in writing."

Thus does invention go from strength to strength, and the new form of pavement-breaker which may now be seen and heard

in constant operation is probably its direst public achievement, from the humanitarian standpoint, outside the Art of War.

All this, it may be said, is matter of common knowledge. It is already almost in the hands of the police. Professor A. M. Low, too, has been called in about it. If, as appears to be the case, he can succeed in deadening the excruciating racket of the Underground, or silencing the engines of his aerial colleagues and other Loud Speakers, every one will wish him well, and something is sure to be done about it. It is forgotten that Smoke Abatement is no further advanced now than it was twenty years ago (except in Nottingham) in spite of the fact that the problem is readily soluble, and has a powerful Society which presses the claims of that solution. Moreover, it is largely owing to the fact that *necessary* noise (by which we mean such noises as are—for a time—economically unavoidable in a given phase of industrial evolution) has become so patent and intolerable that the opportunity arises of dealing effectively with *unnecessary* noise, such as the gratuitous and ever-increasing hubbub of newsboys, street-organs, bells and the like *in residential areas.*

We would emphasize the 'residential' aspect, for there is no reason why there should not be other areas where such activities could be encouraged; areas whose inhabitants should unanimously testify to their tolerance or degradation by inviting all and sundry to bring their cornets, harps, sackbuts, and other kinds of music, and to develop engine-trouble to their hearts' content, or areas set apart by public proclamation such as Brooklands, Shoeburyness, Cambridge, Middlesborough, or Bouverie Street. Why should it not be the Lovers of Noise who have *retreats* set apart for them, and thus leave the civilized world to regain its composure by gradual re-education?

Psychologists have hitherto devoted little attention to the conditions of sustained intellectual work. A certain number of personal idiosyncrasies have been recorded—and the conditions under which Kant and Poincaré happened to get bright ideas have been often recorded. Occasionally, however, distracting influences are enumerated, as, for instance, in Dr. S. Thalbitzer's *Emotion and Insanity*, which will be published in an English translation early next year, with an Introduction by Professor Höffding. The author is Chief of the Medical Staff at the leading Asylum in Copenhagen, and in emphasizing the importance of minor sensory distractions he remarks: "The buzzing of a fly on a window-pane, the slight rattling of a window-fastening, a discordant hurdy-gurdy in the distance—these and similar sensations

may cause displeasure from the first moment. The scarcely audible scratching of a knife on a nail makes me shrink, and is almost sufficient to give me cold shudders." And while one is having cold shudders or suffering from the said hurdy-gurdy, not only is the nervous system being adversely affected, but any form of mental concentration is rendered impossible for normally sensitive people.

Fortunately or unfortunately, however, the majority are no longer normally sensitive, as is evidenced by our architecture, our opera, and our Wembley—by the sounds and colours and shapes which we tolerate around us. One distraction more or less in the racket and turmoil which constitute the daily round of the typist, the grocer, the publisher, or the M.P. can be neglected, nay, perhaps even welcomed as a reminder that he or she will shortly be free to add to the uproar by manipulating the klaxon or the gramophone, or escorting the dogs for a bark. Even Mr. Lucas, who is able and content to take refuge in some haven when overwhelmed by the din, is uneasy as to the world-wide effect of so much induced insensitivity: "The Florentines no longer design Medici chapels, and possibly we may find here the chief part of the penalty that noise exacts. Germany (whose philosopher Schopenhauer in his essay on noise demanded the punishment of every carter who cracked his whip) no longer puts forth any Beethovens or Heines: France no longer gives us a Dumas or an Offenbach: England is without any successor to Shakespeare or Milton. Can such poverty be the result of the callous brutal cacophony of modern life? Certainly it is true that your thinker's first thought is to be remote from distraction: Thomas Carlyle, for instance, with his double doors and double windows and felt-lined walls, and Herbert Spencer, with the ear-flaps . . ."

We are confining ourselves deliberately to the normal urban noises of 1924. The factory and the ship-yard, the engine-room and the printing-press have already begun to exact Retribution. The boiler-maker, the riveter, the metal-caster, the creator of tin-boxes . . . In suburbia his neurosis is called Unrest; its cultural and aesthetic outcome is Manchester, the Movies and the Motor-charabanc. In other spheres Noise is not responsible so much for a deadening of sensibility as for neuroses to which peaceful surroundings are essential. To-day, let us not forget, there are at least 100,000 discharged cases of "shell-shock," to whom the din of modern cities is as devastating as to the brain-worker; and for them as for him there is often for economic reasons no escape. For them the passage of a diseased motor means not merely an hour or an evening wasted, the loss of a fugitive thought at a critical

moment, the thread of a discussion broken, a problem to be tackled again. It reinstates the machine-gun of their nightmare, or the bursting shell that has scarred their soul. To some, sensitivity is natural, others have had its partial equivalent forced upon them by cruel circumstances; but both can at least make common cause against the Ear-splitters and the Vibrationists. In times gone by the needs of the Mind were understood and respected. Sage and convalescent alike could preserve their sanctuaries inviolate; the market and the camp were for those with mercenary and martial tastes; and in China to-day the traditions of this Quietism still linger, as Mr. Russell has been at pains to inform us—though Western ideals seem to have made alarming progress since his departure from Pekin.

Where, then, can the thinker turn to-day in his desire, as Mr. Lucas puts it, "to be remote from distraction." Our older Universities, apart from a few haunts of ancient peace in certain of the Colleges, have succumbed during the past five years to the prevailing din. In Cambridge, which once insisted on its railway-station being over a mile from the University, even the sacred space before the Senate House is now a Motor-bus terminus, and street-organs may be heard at any hour of the day in King's Parade. In Oxford, where academic conditions are somewhat more favourable, thousands of motors have also taken possession of the public ways: we recently observed sandwich-men outside the Sheldonian begging humbly, by means of placards, for silence in the street, while Music was being rendered within—but with no effect as far as the rush of exploding motors was concerned. And on the occasion of his last visit, the latter part of an address by Professor Bergson in the Examination Schools was rendered inaudible by a powerful hurdy-gurdy just beneath the windows. In London, the area in which Consultants and Nursing Homes are situated is equally infested; in spite of warnings and notices to which attention is no longer paid, except, on occasion, in Harley Street and Wimpole Street themselves: and whether in Beaumont Street, Weymouth Street, or Welbeck Street, repose and reflection are perpetually disturbed. Many parts of Bloomsbury are, like St. James Street, subjected to almost continuous "musical" assault. Only the lawyers (unless it be certain streets in Kensington and Mayfair, where butlers are kept in readiness to emerge and drive offenders the statutory 200 yards) have secured a sanctum, and in the purlieus of the Temple one may read: "The Porters have orders to remove anyone making a Noise." But if one profession can succeed, why not another? It is a question of organization.

Meanwhile, let the evidence be collected and let the psychologist in particular contribute his quota. The physician will support him on general grounds, and the publicists can raise their outcry when the resultant scandal has attained adequate dimensions. Let Mr. Valentine Williams, who is the greatest living writer of Detective Stories, apply his brains and his world-wide experience to the problem, and be ready to wield his pen once more in unison with that of Mr. E. V. Lucas, whose vast public of quiet literary persons must include the numerous victims of Cock-crowing, Aeroplane-testing, Cornet-practising, Child-spanking, Power-generating, Change-ringing, Gear-changing, Piano-strumming, Dog-training, Organ-grinding, and so forth, whose plaints appear so frequently in the press. Let a Society be formed in which these and similar philanthropists may co-operate actively or passively with the Doctors and with *Psyche*. Let this Society profit by the experience of such analogous groups as the Smoke Abatement Society, the Footpaths Preservation Society, the S.P.C.A., and the S.P.C.C., and as far as possible work in harmony with them on legal and legislative problems. Much would depend on a suitable title for such a body. Should the financial benefit to the Brain-worker justify the formation of a company, " Hubbub, Ltd." would seem to be indicated. Or, if FIDAC proves a success, UNAC (Unnecessary Noise Abatement Committee) might join it. In any case a Noise Abatement Society would have an attractive telegraphic address in " Hubbub, London," and a 'phone number to match (Pop. 000) should not be difficult to acquire. A new significance might be given to various popular symbols. Thus one department might be known as the N.U.T. (Noiseless Urban Traffic), with R.I.P. (Rubber Improves Pavements) as its slogan ; another might specialize as S.O.S., ETC. (Street Organs Suppressed, Engine trouble, cornets) ; a third might popularize the advantages of domestic utilities typified by S.P.G. (Sound Proof Glass) ; and a fresh use might be found for the battle cries U.D.C. (Unholy Din Control), or B.N.O.C. (Buy Non-Obstreperous Cats). Eventually the State might indicate its appreciation of services rendered, by a re-distribution of titular distinctions such as C.M.G. (Closed Many Garages), or O.B.E. (Obsolete Bell-ringing Eliminated) ; publicists might be honoured for drawing attention to patent abuses by, say, the G.C.S.I. (Gurgling Cisterns Stimulate Insomnia), or manufacturers by a D.D. (Double Doors), the abuse or the patent being in every case appropriately immortalized. On the same principle Academies might reward any scientific conquest of the minor horrors of the night with M.A., D.sc. (Mice Asphyxiated, Deodorizing

same cheaply). A Knighthood could be reserved for more lucrative feats meriting the prefix Sir (Selling inaudible rolling-stock), while epoch-making biological discoveries might justify the appendage BART (Bred Airedales Relatively Taciturn).

Finally, to be truly successful, any such body would require an economic department to deal with such temporary hardships as might be involved by rapid and efficient reforms ; in particular the provision of productive and innocuous employment for existing noise-merchants and musical vagabonds, or their organisation into legitimate bands at the more popular seaside resorts—preferably on the ends of piers, with no power to add to their number.

But this is perhaps looking too far ahead ; and as a first step it would at least be worth while to have the legal position of the individual, of the householder, of the community or area, and of the municipality, clearly defined by experts in relation both to the nuisance and to the police, as regards precedent and possibility alike. For our part we shall be glad to hear from victims and sympathizers who can offer suggestions or support, and to take whatever first steps may be deemed expedient.

Proverbs, tags, and saws which have long been accepted by the layman are constantly being discovered or rehabilitated by the expert, and in Psychology this has been particularly the case. It would be interesting to collect examples, and at the same time to compile a list of those exploded. A few months ago the successful mixture of oil and water was achieved, we understand, by an ingenious machine, but the latest casualty is the result of a psychological constatation and is due to Professor G. M. Stratton. " Like a red rag to a bull " should, it is now claimed, mean " treated with indifference." The Professor endeavoured to interest various bulls, and a variety of cattle, tame and wild, in the colour problem. While bright and moving objects attracted a certain amount of attention among the beasts, Red, as red, failed to arouse their ire or to produce a rush. Moreover, 66 California cattlemen were searchingly interrogated on the subject, and their replies confirmed this negative conclusion. On the other hand, the smell of blood does, in their opinion, create " excitement," or at least curiosity and distrust ; which need surprise nobody. What the historian may now profitably attempt is to discover the origins of the " red rag " legend, if legend it be. In general, too, the range of colour-vision in animals is still an almost untouched field. Certainly the classic experiments of Miss E. M. Smith (Mrs. Bartlett) on Dogs made the alleged effect of the red rag something of a puzzle. But her experiments, and the more recent work of

Professor Köhler with his Apes, have probably only broken the ground for more elaborate research.

A colour problem which touches humans more nearly is that dealt with by Dr. Berkeley-Hill, M.D. (Oxon.), in the July issue of the *Psycho-analytic Review*, which Dr. Smith Ely Jelliffe and his colleague Dr. White continue to maintain at a high level. The author, who has the advantage of working in India, and has already published an instructive paper on Hindu convictions and practices, deals with the attitude of various races to the skin pigmentation of other races darker or lighter, redder or yellower than themselves. His most interesting conclusion is that "lynch law" in America is the outcome of sexual jealousy on the part of the white man of the negro's alleged superior potency, "to the end that he inflicts the most horrible retributions on his unfortunate rival." He is here in disagreement with the findings of Everett Dean Martin in the *Journal of Abnormal Psychology*. It may be added that Dr. Berkeley-Hill couples the factor of sexual jealousy with the primitive association of "blackness" and "evil" (witchcraft, etc.), in accounting for present attractions and antipathies. As he well remarks, the question of colour must be faced sooner or later, for "it is obvious that the happiness and prosperity of the whole human race depend upon its adequate solution."

In our last issue we discussed briefly the remarkable theory as to the relations of the White, Yellow, and Black races put forward by Dr. F. G. Crookshank, who has made a life-long study of Mongolian imbecility. The facial resemblances of Mongolian imbeciles and normal Orientals are not denied by the majority of alienists, but they have been content to attribute them to chance, and to ascribe the mental disease itself to various hereditary taints (of which, as might be expected, syphilis, associated with most of the graver human ills, is a favourite). Dr. Crookshank's theory, however, is only concerned with these "throw-backs" incidentally, for if his correlation of the Chinese with the Orang, the White races with the Chimpanzee, and the Black with the Gorilla be substantiated, it will not be less far-reaching in its effects than the Darwinian hypothesis itself.

Hitherto anatomical evidence has been scanty, for those who have had access to the skulls of the Oriental and the Orang have been curiously negligent of essentials. But in a number of the official organ of the German anatomists, the *Anatomischer Anzeiger* (Vol. 58), just to hand, independent and apparently conclusive

testimony is now available. For eight years (1911 to 1918) Professor Kurz, of Münster University, was on the look out in Shanghai for the chance of anatomical observations on the brains of Chinese (embryonic, infant, and adult) in whom the element of racial intermarriage was unlikely to have complicated the problem. On the basis of a careful study of such brains he has reached conclusions which confirm those of Klaatsch, namely, that the brain of the Yellow races shows marked differences from that of the White, and that the characters in question are for the most part distinctive of the Orang as opposed to the other types of Higher Ape. As a result he is led to adopt the view that the human race could not have arisen from a single pre-human stock (as Sir Arthur Keith and others still maintain), but that there are three distinct types of Man corresponding closely to the three main types of Higher Ape. In addition to Klaatsch, he cites the authority of Arldt, Boas, Buschan, Horst, and Sergi in favour of the polyphyletic view, though he seems to be unaware of the more recent work of Sera and other anthropologists confirming Dr. Crookshank's general contention. His anatomical support is therefore all the more significant, and should make it impossible in future to discuss either the question of Racial origins and characteristics, physical and psychological, or the special problem of Mongolian imbecility without taking full cognizance of *The Mongol in our Midst.*

With the death of Mr. F. H. Bradley, which occurred in his 78th year on September 18, the world of critical and speculative thought loses a venerable figure. In many respects, and for psychologists, Mr. Bradley belonged to a relatively distant past, and represents both interests and methods which are ceasing to appeal to the younger generation. His pre-occupation with so-called ontological and semi-religious problems, in particular, is characteristic of an age when writers like Caird, Green, or Bosanquet still dignified a sort of academic pulpit, and elaborated temporary defences against the inroads of the forerunners of modern scientific tendencies such as Mill, Taine, and Spencer. Later there was the breezy challenge of William James and the logico-mathematical secession of Bertrand Russell, which diverted the attention of the defence from the cosmos to the verbal laboratory ; but Mr. Bradley himself made no determined attempt to grapple with his most formidable opponent in the field of logical argumentation, and even reissued his *Principles of Logic* in 1922, after forty years of reflection, with a weary gesture of unconcern.

The atmosphere in which all this was possible was little favourable to the outlook of modern psychology, and the "stir" created by *Appearance and Reality* (published by the way a full decade before those who are now taking their degrees in psychology were born, and when the author himself was close on fifty) is no longer easy to understand. That Mr. Bradley's remarkable gifts and attractive personality should not have been enlisted in the service of psychology is—to those of us who believe in the future of their science and its promise of absorbing and re-interpreting so many of the older disciplines—in a sense regrettable. For his isolated psychological studies suggest that in this field he might have accomplished something of permanent value. His easy and, at times, incisive style would have sufficed to distinguish his contributions in any branch of the Humanities.

Admirers of Dr. Jung's *Psychological Types*, which was translated into English last year, will be interested to learn that its able translator is announcing a course of Six Lectures to be given at the Rooms of the Analytical Psychology Club, 10, Craven Hill Gardens, W. 2, on Wednesday afternoons, 5.30 p.m. (October 8th—November 12th) dealing with "Analytical Psychology and its Relation to Life." The following syllabus will give an idea of the ground covered :—

OCT. 8. *Evolution of Conscious Function.* Necessity the Mother of Civilization. Egypt, Carthage and Rome. Symbolism of Circle and Square. Chaos and Law. Every Function a Response to Need. Adapted and Unadapted Functions. Discussion on Inheritance of Acquired Characters. Primordial Image. Personal and Impersonal Contents of the Unconscious. Psychic Dualism. Our Ancestor the Frog.

OCT. 15. *Study of Primitive Mentality.* Primitive's Magical Relation to the World. State of "participation mystique." Value of "Magical" Projections. Magic the Mother of Religion. Growth of Idea of God and Idea of Self. Animism—Polytheism and Polydemonism—Monotheism. Objective Fact and Psychological Effect. Two distinct Worlds.

OCT. 22. *Discussion of Psychological Standpoint.* Dynamic versus Static. Purposive versus Mechanistic Viewpoint. Libido-Concept. Purposive Character of Instinct. What is a Complex? Projection a necessary Function of Consciousness. Experience versus Interpretation. Interpretation a Necessity of the Intellect. Experience a

Necessity of the Soul. The Soul as a Psychological Concept.

OCT. 29. *Jung's System of Typification.* Introverted and Extraverted Attitudes. Functions of Judging and Perception. Function Types. Tendency towards Psychic Absolutism. Compensatory Function of Unconscious. Conception of Individual as a Psychic Totality.

NOV. 5. *The Analytical Process.* Transference the Dynamic Factor. Stage of Analysis. Stage of Synthesis. The Individual Myth. Discussion of the Nature of the Dream. The Dream as Directing-post. Education of the Conscious Standpoint. The Factor of Will. Importance of Fundamental Attitude.

NOV. 12. *The Meaning of Individuation.* Repression a Biological Necessity but a Psychological Offence. Transformation of Libido versus Sublimation. Differentiation of Self from State of Participation. Individual Development and Collective Responsibility. Individuality born through Conflict of Opposites. Jung's Concept of Transcendent Function. Relationship as a Psychological Necessity.

The fee for the whole course is 15/-, and tickets may be obtained from the Secretary of the Club at the above address. Each Lecture is complete in itself, so that those unable to attend the full Course will be able to follow single Lectures.

In the April issue of *Psyche* evidence was brought forward by two distinguished authorities to show that certain lines on the hand might be correlated with certain racial distinctions (in particular the single Mongolian line), and that therewith a scientific basis was available for the study of Palmistry. And now we find Dr. Bernard Hollander delivering an address to the British Phrenological Society on " Facts and Theories of Brain and Mind," with the Hon. Sir John Cockburn, K.C.M.G., M.D., in the chair, and maintaining that Phrenology also is once more coming into its own. Sir John Cockburn, introducing the lecturer, remarked upon the unjust treatment which had been meted out to Phrenology, particularly by those who were supposed to be in a position to know better.

Dr. Hollander traced the history of the Science from its beginning, over one hundred years ago, showing how doctors and psychologists were gradually adopting its principles, and often using it in the diagnosis of brain functioning. He quoted the following significant statements by eminent anatomists :—

" We know that functions of different kinds are localised in

different parts of the cortex, and when we see an area on the cerebrum rise up in the form of an eminence we may reasonably conclude that the growth in the area concerned is the structural foundation of a centre of functional activity of an acute kind." And again : " The cranial vault fits like a tight glove on the surface of the enclosed cerebrum." (D. J. Cunningham, Professor of Anatomy in Edinburgh University, British Association Meeting, 1901). " It is the brain growth that determines the form of the cranium, and not the skull that moulds the brain into shape. There can be no doubt that within certain limits the external form of the cranium serves as a reliable guide to the shape of the brain. Indeed, various observers have drawn attention to the fact that in certain regions the outer surface of the skull possesses elevations and depressions which closely correspond to definite fissures and convolutions of the brain." (Johnson Symington, Professor of Anatomy in Belfast University, British Association Meeting, 1903). Mathias Duval, who made the post mortem examination of Gambetta's brain, wrote : " What person has ever been a greater orator and improviser of speeches ? In him the third left frontal convolution was enormously developed."

It was Gall, and not, as stated by Prof. William MacDougall (*Social Psychology*, p. 14), " Darwin, in the ' Descent of Man,' who first enunciated the true doctrine of human motives, and showed how we must proceed, relying chiefly upon the comparative and natural history method, if we would arrive at a fuller understanding of them." Gall realised over a century before MacDougall that " the department of psychology that is of primary importance is that which deals with the springs of human action, the impulse and motives that sustain mental and bodily activity and regulate conduct," and that " the basis required is a comparative and physiological psychology relying largely on objective methods, the observation of the behaviour of men and animals of all varieties under all possible conditions of health and disease."

MacDougall merely repeats what Gall said, that " The mental constitution of man differs from that of the highest animals, chiefly in that man has an infinitely greater power of learning, of profiting by experience, of acquiring new modes of reaction and adjustment to an immense variety of situations. This superiority of man would seem to be due in the main to his possession of a very large brain, containing a mass of plastic nerve tissue which exceeds in bulk the sum of the innately organised parts and makes up the principal part of the substance of the cerebral hemispheres." (p. 327). And he again repeats Gall (p. 20) : " The evidence that the main basis of the human mind, constituted by the sum of innate

tendencies, has a stable unchanging character is afforded by comparative psychology. For we find, not only that these tendencies, in stronger or weaker degrees, are present in men of all races now living on the earth, but that we may find all of them, or at least the germs of them, in most of the higher animals." Moreover, said the lecturer, MacDougall has simply adopted the phrenological classification of the mental powers. There is the Instinct of Pugnacity and the Emotion of Anger, leading to Aggressiveness and overcoming of Resistance ; the Emotion of Fear, which, combined with intellectual activity, gives Circumspection and Foresight, and leads either to Flight or Concealment and Cunning ; the impulses to Collect and Hoard ; the Sex Instinct ; the Love of Offspring ; the Social, Gregarious or Herd Instinct ; the Instinct of Self-Assertion (and Self-Abasement), which leads to " boasting " and " swaggering " and " vanity ; " the Faculties of Imitation, Sympathy, Wonder, and the Religious Emotion.

The description of these dispositions given by MacDougall, and the conclusions drawn by him, differ in no way from those by Gall and his successors, and Dr. Hollander pointed out that papers on " Acquisitiveness," " Anger," " Fear," etc., are constantly appearing in Psychological Journals, and are published apparently in ignorance of the numerous essays on the same subjects by the early phrenologists in the first half of last century, in the Transactions of the various phrenological Societies and the *Edinburgh Phrenological Journal.*

The lecture was divided into two parts, the second consisting of the projection upon the screen of a large number of photographs of celebrities and others, driving home the points made in the first part.

The following are the Fixtures of the Phrenological Society from October to February inclusive :—

SATURDAY, OCT. 18.	Visit to Royal College of Surgeons' Museum.
SATURDAY, NOV. 8.	Annual Congress.
TUESDAY, DEC. 9.	Lecture on " The United States of the Brain," by Sir James Crichton Browne, M.D., L.L.D., D.Sc., F.R.S. (Essex Hall).
TUESDAY, JAN. 13.	Annual Social Meeting.
TUESDAY, FEB. 10.	Lecture on " Phrenological Reminiscences " by C. W. Withinshaw, Esq., L.R.C.P., L.R.C.S., L.M. (Edin.), F.B.P.S.
SATURDAY, FEB. 14.	Visit to Royal College of Surgeons' Museum.

For particulars of the Society and its Meetings application should be made to the Hon. Secretary, British Phrenological Society, 65, Chancery Lane, London, W.C. 2.

MATERIALISM, PAST AND PRESENT

By Bertrand Russell, F.R.S.

Materialism as a theory of the nature of the world has had a curious history. Arising almost at the beginning of Greek philosophy, it has persisted down to our own time, in spite of the fact that very few eminent philosophers have advocated it. It has been associated with many scientific advances, and has seemed, in certain epochs, almost synonymous with a scientific outlook. Accusations of materialism have always been brought by the orthodox against their opponents, with the result that the less discriminating opponents have adopted materialism because they believed it to be an essential part of their opposition. At the present moment, the official creed of one of the largest States in the world is materialism, although hardly any one in the learned world explicitly adheres to this theory. A system of thought which has such persistent vitality must be worth studying, in spite of the professional contempt which is poured on it by most professors of metaphysics.

Lange's *History of Materialism*, about to be re-issued in English, is a monumental work, of the highest value to all who wish to know what has been said by its advocates, and why philosophers have in the main remained unconvinced. The first edition appeared in 1865, at the height of the period often described as "The materialistic '60's." The preface to the second edition is dated June, 1873. The author died in 1875, before the reaction against materialism had made itself felt. Lange, while very sympathetic to materialism in its struggles with older dogmatic systems, was himself by no means a materialist. He is described by Professor Cohen, in the Preface to the Ninth Edition (1921), as an "apostle of the Kantian view of the world," to which Professor Cohen himself adheres. The description is quite correct. Lange considers that materialism is unable to explain consciousness, and is refuted, on scientific grounds, by the psychology and physiology of sensation, which shows that the world studied by physics is a world dependent on our modes of perception, not a world existing independently on its own account.

It is a commonplace to object to materialism on ethical grounds, since it is supposed to have a deleterious effect on conduct. While energetically repelling many forms of this criticism, Lange never-

theless upholds it in the end, since he regards the economics of the Manchester school and the ruthlessness of modern competition as attributable to a materialistic outlook. This is perhaps the weakest part of his book, in spite of the fact that, unlike most German learned men, he had considerable experience of practical life. In 1861, at the age of 33, he resigned his position as a teacher, and became secretary of the Duisburg Chamber of Commerce. But his position became difficult owing to his radical opinions, which found vent in various directions. He edited a newspaper called *The Rhine and Ruhr Gazette*, and he wrote a book called *Die Arbeiterfrage in ihrer Bedeutung für Gegenwart und Zukunft*, which appeared in the same year as his *History of Materialism*. His industry was little short of miraculous, for in this same year he published yet another book, *Die Grundlegung der mathematischen Psychologie*—and all this without neglecting the newspaper or the Chamber of Commerce.

In the following year (1866) he went to Switzerland, where he again took up academic work, becoming Professor at Zurich in 1870, and returning to Germany in 1872 as Professor at Marburg. But his experiences in the world of industry and commerce undoubtedly helped to widen his outlook, and to give him an understanding, not always possessed by the learned, of the operation of theories when they pass out into the market place. He remarks that, in England, philosophers are often statesmen, and, what is still more extraordinary, statesmen are sometimes philosophers. He does not point out how often the mixture is damaging to both, making the statesman too theoretical and the philosopher too practical.

Lange's book is divided into two parts, one dealing with the times before Kant, the other with Kant and his successors. This division shows the very great importance which he attaches to the philosopher of Königsberg—an importance which, perhaps, may seem less as time goes on. Kant's system is intimately bound up with the state of the exact sciences in his day: Euclidean geometry gives the foundation of the transcendental aesthetic, and the Aristotelian syllogism gives the ground for the deduction of the categories. Now that geometry has become non-Euclidean and logic non-Aristotelian, Kant's arguments require re-statement; to what extent this is possible, is still a moot question. To the present writer, the first half of Lange's book appears considerably better than the second, because it is less affected by the author's views on matters which are still undecided. In the periods before Kant, his critical judgment is extraordinarily sound. The account of Greek atomism, the analysis of Plato's influence for good and

evil, are admirable. The combination of scientific materialism with theological orthodoxy in seventeenth century England, and its contrast with the revolutionary materialism of eighteenth century France, are set forth with a nice historical sense. But it is always a very difficult task to see one's own time in historical perspective. Apart from philosophical predilections, there is difficulty in disentangling what is important and permanent in the purely scientific work of one's own generation. The problems which occupied the men of science sixty years ago were very different from those of the present day, and it was impossible to know which of them would prove to be historically important.

On the question: what is true and what false in materialism? it is possible to speak with more learning and more complication than in former days, but it may be doubted whether any substantially new arguments have been invented since Greek times. Nevertheless, it may be profitable to attempt a survey of the position as it appears in the light of modern science.

The theory of Democritus was intelligible and simple. The world consisted of hard round atoms of various sizes, all falling, but the heavier atoms falling faster, so that they would occasionally inpinge upon the lighter atoms. If the impact was not exactly in the line of centres, there would be a resultant sideways motion, which accounts for the fact that bodies do not move only in one direction. This view, of course, had to be modified for purely physical reasons, but the modifications were not important until we come to Descartes with his plenum and his doctrine of vortices. This showed that atomism is not an essential part of materialistic physics. Newton's followers introduced another modification, namely, action at a distance (which Newton himself still regarded as impossible). To this day the oscillation continues between atoms with action at a distance and a continuous medium (the aether) with continuous transmission of effects. Few physicists nowadays cling to either as a matter of principle; the only question is: which best explains observed phenomena? Both views have in common a belief in physical determinism, *i.e.*, a belief that what happens in the world dealt with by physics happens according to laws such that, if we knew the whole state of the physical world during a finite time, however short, we could theoretically infer its state at any earlier or later time. This is the kernal of materialism from the standpoint of ethics, religion, sociology, etc., though not from the standpoint of metaphysics. If physical determinism is true—if, that is to say, everything that we commonly regard as the motion of matter is subject to laws of the above kind—then, although there may be a concurrent

world of mind, all its manifestations in human and animal behaviour will be such as an ideally skilful physicist could calculate from purely physical data. Physics may still be unable to tell us anything about a man's thoughts, but it will be able to predict all that he will say and do. Under these circumstances, a man will be, for all practical purposes, an automaton, since his mental life can only be communicated to others or displayed in action by physical means. Even his thoughts can be inferred from physics, unless he is content never to give utterance to them.

This point of view resulted from Cartesianism, though most Cartesians attempted to escape from its consequences. Lamettrie, author of *L'homme machine*, justly claimed that he had derived his philosophy from Descartes. Descartes, who knew about the conservation of *vis viva*, but not about the conservation of momentum, endeavoured to safeguard human freedom by maintaining that the will could alter the direction of motion of the animal spirits, though not the amount of their motion. He did not, however, extend this freedom to animals, which he regarded as automata. Nowadays no one would dream of drawing such a distinction between men and animals. And even his immediate followers had to abandon his position on this point, owing to the discovery of the conservation of momentum, which showed that the quantity of motion in each direction must be constant. From that day to our own, many philosophers have advocated the theory of two parallel series, one mental and one physical, each subject to its own laws, and neither influencing the other. This theory has less plausibility in our time than it had formerly ; but apart from the question of its truth, it is worth while to realise that it does not afford an escape from the more disagreeable consequences of materialism.

If there is parallelism between the physical and mental series, as this theory supposes, every physical law must have its psychological counterpart, and therefore psychology must be as rigidly deterministic as physics. There will be, so to speak, a dictionary, by which physical events can be translated into the concurrent mental events. Given this dictionary, the Laplacean calculator can, by physics alone, deduce the state of the material world at any given time, and discover from the dictionary what must be the corresponding state of the mental world. Clearly, the emancipation from physics which anti-materialists desire, is not to be achieved along these lines.

There is, however, no good reason to accept the theory of psychophysical parallelism. The dualism of mind and matter is probably not ultimate, and the supposed impossibility of interaction rests

upon nothing better than scholastic dogmas. To common-sense it appears that our minds are affected by what we see and hear, and that, conversely, our bodies are affected by our volitions whenever we will to make any movement. There is no reason whatever to suppose that common-sense is mistaken in this view, although, of course, there is great need of analysis as to what really takes place when we perceive or will.

Lange advances, quite justly, as an argument against materialism, the fact that we only know about matter through its appearances to us, which, according to materialism itself, are profoundly affected by our own physical organisation. What we see depends not only upon what is there to be seen, but also upon the eye, the optic nerve, and the brain. But the eye, the optic nerve, and the brain are only known through being seen by the physiologist. In this way materialism is driven back to sensationalism. If it is to escape sensationalism, it must abandon the empirical scientific method, substituting for it the dogmatism of an *a priori* metaphysic, which professes to know what is behind appearances. Historically, we may regard materialism as a system of dogma set up to combat orthodox dogma. As a rule, the materialistic dogma has not been set up by men who loved dogma, but by men who felt that nothing less definite would enable them to fight the dogmas they disliked. They were in the position of men who raise armies to enforce peace. Accordingly we find that, as ancient orthodoxies disintegrate, materialism more and more gives way to scepticism. At the present day, the chief protagonists of materialism are certain men of science in America and certain politicians in Russia, because it is in those two countries that traditional theology is still powerful.

The two dogmas that constitute the essence of materialism are : First, the sole reality of matter ; secondly, the reign of law. The belief that matter alone is real will not survive the sceptical arguments derived from the physiological mechanism of sensation. But it has received recently another blow, from the quarter whence it was least to be expected, namely, from physics. The theory of relativity, by merging time into space-time, has damaged the traditional notion of substance more than all the arguments of philosophers. Matter, for common-sense, is something which persists in time and moves in space. But for modern relativity-physics this view is no longer tenable. A piece of matter has become, not a persistent thing with varying states, but a system of inter-related events. The old solidity is gone, and with it the characteristics that, to the materialist, made matter seem more real than fleeting thoughts. Nothing is permanent, nothing endures ; the prejudice that the real is the persistent must be abandoned.

The notion of substance has not been regarded by philosophers as metaphysically valid since the time of Hume and Kant, but it persisted in the practice of physics. Its defeat, within physics, by the abandonment of a single cosmic time affords a purely scientific argument against the older type of materialism, which utilised the belief that substance is what persists through time.

The reign of law raises more difficult and also more important questions. The outlook with which the phrase "reign of law" seems to belong most naturally is that of Newton, especially as developed by his disciples. Belief in the reign of law is often combined with strict theological orthodoxy, but in that case human volitions are excepted, at any rate in certain cases. The reign of law only becomes part of the materialistic outlook when it is believed to have no exceptions, not even human volitions. It is in this form that we have to consider it. It will be necessary first to define the phrase, and then to inquire what ground there is for believing it applicable to the world.

The definition of the reign of law is by no means so easy as seems often to be supposed. The idea is derived from such instances as the law of gravitation in the solar system, where a simple formula enables us to predict the motions of the planets and their satellites. But this instance is deceptive in several respects. In the first place, there is no reason to suppose that the laws in other cases are equally simple. In the second place, it turns out that the Newtonian form of the law of gravitation is only approximate, and that the exact law is enormously more complicated. In the third place, the geography (if one may use such a term) of the solar system is amazingly schematic. To a first approximation, it may be regarded as consisting of a small number of mass-points, whose individual motions are easily observable. This point of view is not adequate for dealing with such matters as tides, but it suffices for the deduction of Kepler's laws from the law of gravitation, which was Newton's most spectacular achievement. It is obviously a very different matter to obtain laws applicable to individual electrons and protons, because of the greater geographical complexity involved. For these reasons, among others, it is rash to regard the Newtonian astronomy as typical of what is to be expected in physics.

The least that can be meant by the reign of law is this: given any phenomenon, there exists some formula of finite complexity such that, from a sufficient (finite) number of data at other times the phenomenon in question can be calculated. In practice, the "other times" will usually be earlier times, but this is not always the case—for example, in speculations as to the geological history

of the earth or the origin of the solar system. Theoretically, it should be irrelevant whether the "other times" are earlier or later than that of the phenomenon concerned.

In elucidation of the above definition, there are one or two observations to be made. The reason for saying that the formula must be of finite complexity is that otherwise nothing is asserted beyond a logical truism. By admitting formulae of infinite complexity, any series of events whatever could be brought within the compass of a single law, and therefore we should assert nothing in asserting the reign of law. The reason for insisting that the number of data required must be finite is similar, but is reinforced by another, namely, that we cannot manipulate an infinite number of data, and could therefore never discover evidence either for or against a law which required them.

There is a further point which should be borne in mind. None of our observations are completely accurate ; there is always a margin of error. Consequently we can never prove that events obey *exactly* any law which is found to work within the margin of error, nor, conversely, need we trouble ourselves about inaccuracies which must remain below this margin. For example : it is always assumed in physics that continuous functions can be differentiated, although, as a matter of pure mathematics, this is known to be only sometimes the case. There is no harm in this from the physicist's standpoint, because, given any continuous function which cannot be differentiated, there will always be another which can be differentiated, and which differs from the first by less than the probable error in our observations. Approximations are all that we can achieve, and therefore all that we need attempt.

The question now arises : Is there any reason to believe in the reign of law in the above sense ? In the world of pure physics there are a number of fundamental occurrences which cannot at present be reduced to law. No one knows why some atoms of a radio-active element disintegrate while others do not ; we know statistical averages, but what goes on in the individual atom is completely obscure. Again, the spectrum of an element is caused by electrons jumping from one possible orbit to another. We know a great deal about the possible orbits, and about what happens when a jump takes place, and about the proportion that choose one possible jump as compared to those that choose another. But we do not know what (if anything) decides the particular moment at which an electron jumps, or the particular jump that it decides to make when several are possible. Here, again, it is statistical averages that we know. It is therefore open to anybody to say that, while averages are subject to law, the actions of individual electrons

have a certain range of caprice, within which there is no evidence for the reign of law. A man who maintained such a view dogmatically would be very rash, since to-morrow he might be refuted by some new discovery. But a man who merely maintains that, in the present state of physics, it is a possibility to be borne in mind, is displaying a proper scientific caution. Thus even within the pure physics of inorganic matter the reign of law cannot be asserted to be indubitably universal.

This doubt cannot but be increased when we pass on to biology and psychology. I do not mean that there is any positive evidence against the reign of law; I mean only that the evidence in its favour is less strong, because fewer laws are known, and prediction is as yet only possible within very narrow limits. The discovery of quanta in physics shows how rash it is to dogmatise as to the further surprises which even an advanced science may have in store for us; and psychology is by no means an advanced science.

In the present condition of human knowledge, therefore, either to assert or to deny the universal reign of law is a mark of prejudice; the rational man will regard the question as open. All perennial controversies, such as that between determinists and believers in free will, spring from a conflict between opposing passions, both wide-spread, but one stronger in one man and the other in another. In this case, the conflict is between the passion for safety and the passion for power, because if the external world behaves according to law we can adapt ourselves to it. We desire the reign of law for the sake of safety, and freedom for the sake of power. Common-sense assumes that law governs inanimate nature and one's neighbours, while freedom is reserved for oneself. In this way both passions are gratified to the full. But philosophy demands some more subtle reconciliation, and is therefore never weary of inventing new ways of combining freedom with determination. The sceptic can merely observe this struggle with detachment, and he is fortunate if his detachment does not degenerate into cynicism.

It has always been customary, and since the time of Kant it has been thought even respectable, to invoke moral considerations in support of freedom. While, however, the sceptic has a good case as against the dogmatic believer in the universal reign of law, he is not likely to admit the opposite claim that a dogmatic disbelief in this principle is helpful to morals. If he is a sceptic worthy of the name, he will begin by saying that no one knows what beliefs are helpful to morals, or even whether beliefs have any noticeable influence on conduct. But if he is a student of history, he will observe that, as a practical postulate, belief in natural law has

borne good fruit by producing such knowledge as we possess, whereas its rejection has been associated with intolerance and obscurantism. He will say that, though possibly there may be phenomena not reducible to law, this is a mere speculative possibility, of which it is unnecessary to take account in the actual practice of science, since science can only advance by the discovery of laws, and where (if anywhere) there are no laws, there is also no possible science.

In our own time, the old battle of materialism persists chiefly in biology and physiology. Some men of science maintain that the phenomena of living organisms cannot be explained solely in terms of chemistry and physics; others maintain that such explanation is always theoretically possible. Professor J. S. Haldane may be regarded, in this country, as the leading exponent of the former view; in Germany it is associated with Driesch. One of the most effective champions of the mechanistic view was Jacques Loeb, who showed (*inter alia*) that a sea-urchin could have a pin for its father, and afterwards extended this result to animals much higher in the scale. The controversy may be expected to last for a long time, since, even if the mechanists are in the right, they are not likely soon to find explanations of all vital phenomena of the sort that their theory postulates. It will be a severe blow to the vitalists when protoplasm is manufactured in the laboratory, but they will probably take refuge in saying that their theories only apply to multi-cellular organisms. Later, they will confine vitalism to vertebrates, then to mammals, then to men, and last of all to white men—or perhaps it will be yellow men by that time. Ordinary scientific probability suggests, however, that the sphere of mechanistic explanation in regard to vital phenomena is likely to be indefinitely extended by the progress of biological knowledge.

Psychology, which might have been expected to be more opposed to materialism than any other science, has, on the contrary, shown decided leanings in that direction. The behaviourist school maintains that psychology should only concern itself with what can be seen by external observation, and denies totally that introspection is an independent source of scientific knowledge. This view would make all the phenomena with which psychology is concerned physical phenomena, thereby conceding to materialism the utmost of its claims. Apart, however, from other difficulties, there is the difficulty already noted, that the data of physics are sensations, which are infected with the subjectivity of the observer. Physics seeks to discover material occurrences not dependent upon the physiological and psychical pecularities of the observer. But

its facts are only discovered by means of observers, and therefore only afford data for physics in so far as means exist of eliminating the observer's contibution to the phenomenon. This elimination is not an easy matter. It might be argued, on philosophical grounds, that it is impossible, and this is no doubt true if *complete* elimination is meant. But to a certain extent the problem can be treated scientifically, without raising metaphysical issues. It is then found that subjectivity is of three kinds, physical, physiological, and psychical. The first of these is satisfactorily dealt with by the theory of relativity: the method of tensors is its complete theoretical solution. The second and third are perhaps not really distinct; they can be dealt with in so far as one man's perceptions differ from another's, but it is difficult to see any method of eliminating subjective elements in which all men are alike.

There is one other respect in which psychology has been tending towards the point of view advocated by materialists. We used to hear much of such supposed faculties as "consciousness," "thought," and "reason." Many modern psychologists, following William James, are inclined to dismiss "consciousness" as a term destitute of any clear meaning. "Thought" and "reason," meanwhile, are found to be analogous to processes of learning among animals, which are ultimately reducible to the law of habit. All this, of course, is still controversial; but if it should prove correct, the psychological difficulties of materialism will be greatly diminished.

The conclusion of the above discussion would seem to be that, as a practical maxim of scientific method, materialism may be accepted if it means that the goal of every science is to be merged in physics. But it must be added that physics itself is not materialistic in the old sense, since it no longer assumes matter as permanent substance. And it must also be remembered that there is no good reason to suppose materialism metaphysically true: it is a point of view which has hitherto proved useful in research, and is likely to continue useful wherever new scientific laws are being discovered, but which may well not cover the whole field, and cannot be regarded as definitely true without a wholly unwarranted dogmatism.

THE NATURE AND VALUE OF RHYTHMIC MOVEMENT[1]

By E. Jaques-Dalcroze

The aim and purpose of all gymnastics is to awaken and develop, by means of repeated exercises, the living mechanism of some particular portion of the human body. Hygienic gymnastics ensures the complete functioning of the body, sporting gymnastics enables the body to put forth its maximum effort in certain special tests. Vocal gymnastics develops the mechanism of the larynx, the diaphragm, and the lungs, with a view to the effective production of sound. Keyboard gymnastics controls arms, hands, and fingers, enabling them efficiently to interpret pianoforte music.

There is also purely mental gymnastics intended to develop memory, concentration of mind, will, etc. If, therefore, we have to define the rhythmic method of gymnastics, it is an easy matter to affirm that its object is to arouse and develop, by repeated exercises, the natural rhythms of the body. But it will be more difficult to define these rhythms themselves, for they are very complex, or to explain the exercises of the method, for each of them is intended—whether the method demands it or not—to satisfy many different needs. We will at the outset endeavour to explain what are the human rhythms which this method attempts to create and develop.

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A rhythm is a series of connected movements forming a whole and capable of being repeated. The minimum number of movements forming a rhythm is two. The rhythm of breathing consists of inspiration followed by expiration, that of eating consists of absorption followed by deglutition or swallowing. These two elementary rhythms can dispense with education of any kind. Another elementary rhythm, however, that of walking, which also consists of two actions, lightly raising a leg and then placing it heavily on to the ground—a rhythm quite natural in the lower animals—requires, in the case of many children, to be called into being by parent or nurse, by means of exercises in passive gymnastics. What I mean is that this rhythm becomes automatic only after a certain period of training.

[1] Authorised Translation by Fred Rothwell

Thus we are enabled to affirm the existence of a whole series of human rhythmical actions, which, in order to acquire free, *i.e.*, automatic exercise, cannot dispense with certain preparatory exercises constituting the gymnastics that forms part of all bodily education. Ordinary education, however, makes no attempt to produce more than a few natural rhythms necessary to life, according to modern standards. And when we find ourselves removed from our present conditions of existence and activity, we discover that we are deprived of the use of certain natural rhythms which no longer manifest spontaneously, because they are not directly necessary to our style of life. As a result of the invention of various mechanical modes of locomotion, our legs no longer possess all their original powers of leaping, crawling and climbing. In consequence of our way of clothing ourselves, our feet, elbows, shoulders, and hips have lost somewhat of their suppleness, and oppositions of every kind so violate or warp the mechanism of certain motor habits that combined action—which alone can bring about rhythm—is made difficult or even impossible.

The gymnastics of hygiene and of sport restore to the body a considerable number of natural rhythms which it was thought had been utterly lost, but if we analyse the human organism we see that all its movements do not depend solely on effective muscular action, and that a natural rhythm, expressing some particular state of mind, becomes less regular or free when this mental state is impaired. The spontaneous rhythms of the body have synchronous mental rhythms to collaborate with them. Whenever there is change in a mental rhythm, to restore the balance the bodily rhythm must be modified, and *vice versa*. Unfortunately the balance between the two rhythms is generally compromised by oppositions of a nervous order. The bodily rhythm, thus uninformed, cannot adapt itself to the mental rhythm ; mind combats matter. Hence disorder throughout the organism, disharmony of the various parts of the individual, depriving the psycho-physical faculties of their full freedom of action.

Rhythmic gymnastics attempts to set up relations between instinctive bodily rhythms and those created by the senses or by the will. Rhythm is an indispensable complement both of hygienic and of intellectual or artistic gymnastics.

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We are aware that any bad news, any emotion, acts directly on the diaphragm, causing it to contract. So long as the contraction continues, the beating of the heart is modified, the mental rhythms change for the worse, and all active rhythm is hindered. Certain exercises in relaxation enable us rapidly to bring back the diaphragm

to its normal state, and all our other natural rhythms are released. Equilibrium of organic rhythm depends on the vigour with which we can set at liberty some partial activity in which the lack of rhythm compromises the rhythm of the whole. Hence we may well ask ourselves if ordinary education anticipates the possibility of disconnecting the natural rhythms of the child, then of ensuring the possibility of his reacting on each of them separately, so as to become in a position to harmonise them, even unknown to himself, and to resist instinctively any temporary lack of harmony. This is the problem we are trying to solve.

Certainly we are very far from having attained our object, but the important thing is that a number of teachers and psychologists are now endeavouring to find, in the education of the immediate future, the surest and most rapid means of establishing communication between the various currents of our psycho-physical life and of enabling children's bodies to be under the full control of their thoughts.

In a word, exercise should have a threefold object: 1, by means of hops—the word of command coming unexpectedly—it conduces to spontaneous bodily rhythms in every part of the body; 2, by repeated appeals to concentration, it lessens the harmful effects of certain ill-timed rhythms and strengthens those of beneficial rhythms, the result being a state of balance between the nerve centres and the muscular forces; 3, by harmonising the functions of the body with those of the mind, it ensures free play and expansion to imagination and feeling through the state of satisfaction and joyful peace that follows.

Let these exercises be accompanied by signals or words of command, the object of which is to keep body and mind 'under pressure,' to produce either movements, or sudden halts, or else a combination of halting and moving, to enable the mind to choose—out of all the muscles—the one most necessary for the action demanded and to keep the other muscles motionless, to train the nervous system in such a way that the commands transmitted by the mind may be immediately and completely performed, to combine or to break off imposed rhythms, to combine and interchange spontaneous and reason-controlled rhythms, to influence the mind by the irresistible might of instinctive rhythmic movements and the body through the centres of volition;—in a word, to permeate the subconscious forces with conscious forces, and *vice versa*.

Commands may be given both by sight and by sound. What I mean is that the master's *gesture* or his *attitude* controls either a direct and immediate imitation or a rapid association of motor

ideas in the pupil. Or else the *words* uttered by the master influence the pupil and force him into action. These two sorts of command, however, act only on the will or exercise only reflex action; consequently they educate only the conscious or the unconscious powers of the pupils. All that part of education by rhythm which aims at penetration of the subconscious mind is entrusted to a more powerful influence than word or sight: to *music*, a pre-eminently rhythmic art, both exciting and soothing, which acts not only on the nervous sensibility but also direct on the feelings.

From its birth, music has registered the rhythms of the human body of which it is the complete and idealised sound image. It has been the basis of human emotion all down the ages. The successive transformations of musical rhythms, from century to century, correspond so closely to the transformations of character and temperament that, if a musical phrase of any composition-type is played, the entire mental state of the period at which it was composed is revived; and, by association of ideas, there is aroused within our own bodies the muscular echo or response of the bodily movements imposed at the period in question by social conventions and necessities. If we would restore to the body all the rhythms it has gradually forgotten, we must not only offer it as models the jolting, rioting rhythms of savage music, but also gradually initiate it into the successive transformations which time has given to these elementary rhythms. Thus, during his lessons, the master of rhythmic movement must do more than use percussion instruments, like those of negroes or Indians. He will also have to become thoroughly acquainted with the elements of melody and harmony; he must be a musician in the fullest sense of the word.

For rhythmic movement is ennobled by melody and harmony. These rouse the organism, stimulate the muscular energies and strengthen the powers of imagination. Experience has taught us, in elementary schools, that rhythms *struck* by the master with his hands or by tapping on the ground with a stick can be imitated by the children with considerable accuracy and intelligence, but that they are not encouraged to complete the rhythms or to graduate them for themselves, whereas when played on the piano, there is instilled a spirit of joy and dash in both the body and the mind of the little ones, and their powers of invention are directly stimulated. Certainly it is unnecessary that the children should be influenced during a whole lesson by music which deprives them of all freedom of control and makes their task too easy, and so it is better that the music should not be constantly played

throughout the lesson or exercises. None the less, is it necessary that the master should have recourse—whenever he wishes—to this higher form of stimulus. Therefore, until man has regained most of his natural rhythms, education by and for rhythm will need to be supplied by masters who are instinctively musical and acquainted with all the resources of the art. The teacher must know how to use musical methods and employ only music that is simple and appropriate to the age and character of the children.

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Some have imagined—the mistake is less common nowadays—that the complexity of these exercises would be calculated to induce a certain amount of brain fatigue in the child. Nothing of the kind ever happens ; a state of mental and physical equilibrium cannot possibly create fatigue. It is, however, important that the exercises should be graduated, distributed, and arranged so that the cerebral never predominates over the physical, that each attempt to disconnect or to connect non-spontaneous movements should be preceded by exercises intended to create automatic action, that the child's natural rhythms, from the very outset, should be made so *living* that the constant intervention of new or forgotten rhythms acts as a delightful repose, and, finally, that the master should give at least half the exercises of the lesson in the form of *play*. Under such conditions, there is no need to dread a sense of fatigue. Besides, the master cannot possibly fail to recognise when a child is tired ; if inattention or yawning takes place, it is easy to bring about a restful condition either by relaxation exercises or by direct appeals to curiosity or imagination.

Speaking of relaxation, the beneficent *rôle* of exercises intended to check for the moment all nervous, muscular or mental activity is apparently still unknown to many teachers. Exercises in relaxation are particularly useful alike for adolescents and for adults. It would be impossible to insist too strongly on the necessity of making constant comparisons, in the minds of the pupils, between the state of each limb—or of all the limbs—at rest and their different states when active. Besides, it is only because a state of complete relaxation frequently intervenes that we note the close relations which exist between the muscular gradations of force and the various degrees of duration. In a lesson for adults, one third of the exercises may be gone through lying down. What a relief when the pupils are then called upon for vigorous spontaneous movements, running and leaping ! To my mind it is quite useless to subject amateur pupils to difficult mathematical problems. Is not the main thing, for adults and children alike, to enable body and mind to interpenetrate ? Now, when the mind of an

adult is engaged on the solution of a complicated problem, his body becomes an inert mass, quite distinct from his mind. To enable the body to share in the brain activity, the latter must not be permitted to absorb all the forces of life.

The studies of those engaged in teaching rhythmic movement must not be applied too vigorously to the solving of difficult problems. If they would merit the honour of bringing new principles before future generations, they should become thoroughly acquainted with these principles and consider every aspect of the problem. At present, their task is very complex, seeing that the various branches of rhythmic movement have not yet become specialised. As a result of this, they have to deal with physiology and psychology, music and geometry, plastic movement and education, at one and the same time. But the difficulties of this manifold task need not terrify them. If their knowledge of music is adequate, and their love for humanity—for that alone is all-important—strong enough to enable them to make men's hearts thrill, to instruct and convince the human mind, they will bring their many and various labours to a successful issue, for there is one common element, of singular potency, that animates and unites them : rhythm.

Musical rhythmic movement consists in linking up durations, geometry consists in linking up fragments of space, while living plastic movement links up degrees of energy. The necessity of undertaking so many different studies should not appear so difficult that we are afraid to continue along the path we have mapped out for ourselves. Think : the small amount of work we carry through in order to discover the various mechanical contrivances at the disposal of the human body, itself involves much investigation and a whole series of tasks of a different order. Each movement we have to perform in a given *tempo* requires further muscular preparation if we wish to repeat it in a different *tempo*. Each line traversed by a limb in a given space and time becomes shorter or longer according to the degree of energy required to make the movement. Each duration of time traversed by a limb at a given rate of muscular energy becomes prolonged or shortened according to the length of the space to be traversed. Besides, each modification of space, duration, or force, exercises such an influence on the balance of the body that it must inevitably be accompanied by an entire series of correcting efforts made by muscles that either help or hinder. Any error in the transmission of cerebral decisions brings anarchy into the muscular system. All resistance in the nervous system disturbs the brain, and any error of the brain disturbs the nervous system. In a word, the

many factors of our life of movement act co-operatively. So also must act the specialised applications of elementary rhythmic movement.

All the laws that govern the harmonising of our bodily rhythms govern that of the specialised rhythms, and set up relations between the arts dealing with sight and those dealing with sound, between architecture and mechanics, between mechanics and music, between music and poetry, between poetry and art, between art and science, between science and life, between life and society. If we are aware that the science of rhythm consists mainly in fixing the laws of balance and economy, and if we make the needed effort to humanise this science in such fashion that we feel it vibrating and thrilling in our own body, as a living part of ourselves, we shall have much less trouble and difficulty in studying its many problems. We shall also expend less time, for we shall be able to economise and balance will and strength, to establish the right relations between strength and time, between time and will.

Economy and balance: such should be our motto. We must economise our nervous expenditure, which expresses itself in angry starts, sudden, irregular, impatient movements, depression, hypersensitiveness. We must economise our time, cease work before the point of fatigue is reached, anticipate the moment when rest becomes necessary. And we must economise our will to progress, moderate our appetites, and balance our desires of creation with the means at our command.

No doubt at times we have to give ourselves up whole-heartedly in certain directions, to respond to enthusiastic ideals which carry us, as on pinions, beyond the bounds of ordinary life, to powerful impulses and appeals that remove from our minds all petty calculations and prudent self-interests. But we should also be able to recover our balance when this becomes necessary ; after wandering astray on the wings of phantasy we must return to the solid realities of existence. From this balancing of our active powers will result greater confidence in ourselves, greater capacity for effectively giving out whatever may be of service to others. It is absolutely necessary that we have confidence both in the end we pursue and in our means of attaining it. Work done in anguish and uncertainty is bad work. From the very beginning we must be able to limit our desire for progress, and not exact from ourselves more than we are able to give out or expend. The one essential point is that we should know clearly what progress Nature enables us to effect, and not stubbornly insist on attempting as much as those who possess greater ability and powers than ourselves. Nor must we forget that inequality in gifts or talents also involves balance :

if there were none but superior persons in the world, capable of performing the most complicated educational tasks, there would be no one left to carry out the quite simple duties of life.

Children need—above all else—masters who love them and make a point of getting to know them. These masters—in the particular case with which we are here dealing—should be able to improvise on the piano correct musical rhythms, they should be acquainted with the mechanism of the body as regards its relations to nervous and cerebral forces and should also have a certain general culture. In all this, there is nothing beyond human capacity. The one thing to consider before taking up this study is to try to find out how much time and strength it requires, and not obstinately —the only exception to the above-mentioned rule—to attempt to economise this time ; for it must not be forgotten that, between action and duration, there exist relations that cannot be modified... If we know all this and do not recoil before difficulties, we shall find that our task is pre-eminently encouraging and productive of happiness ; the work of a teacher of rhythmic movement enables him—more than any other person—to react against fatigue and the cares of life. Rhythmic movement is a very focus of energy and joy, and all who study it are upheld by the consciousness that they are aiming at the same goal and are linked to one another by bonds of solid affection which give them renewed strength, security and courage.

THE PROBLEM OF THE TERROR DREAM

By GEORGE H. GREEN, B.Sc., B.Litt.

The Freudian psychology has for the most part grown up as a result of Freud's investigations into the problems presented by the dream, and consequently criticisms of his theory of dreams affect also, more or less profoundly, the doctrines which have been built up on the foundation of this theory. To no adverse criticisms has greater attention been paid in Britain than to those of the late Dr. W. H. Rivers.

Rivers has maintained that the theory of "wish fulfilment" fails to hold in the case of a great many dreams, that the current conflict in the mind of the dreamer is of greater importance than are infantile episodes, and that the "sexual" interpretation of the elements of the dream is unduly stressed, often without warrant. Thus it is seen that Rivers attacks, not a few unimportant issues, but the very foundation stones of the Freudian structure. It is the purpose of this paper to deal in detail with the first of these criticisms; the remainder being more cursorily dealt with, and only in connection with such points as arise in connection with the main issue.

"Wish fulfilment" is universally accepted as a satisfactory explanation of the ordinary dreams of a young child, which in some cases persist into adult life. A type of dream—the well-known "terror dream"—is, however, very common in early childhood, which it is very difficult to explain upon the basis of the "wish fulfilment" theory.

I have, for some time, made endeavours to collect specimens of these dreams from young children with whom I have been brought into contact. It is, however, extremely difficult. The child wakes in the night, and cries out for its parents; and when these come, often continues weeping for some time. When the child has been pacified, it begs its parents to remain with it, or at least to leave a light in the room. Often the child appears to be wildly excited, its eyes are unnaturally bright, its face is flushed, and it shows many of the external signs of terror. Occasionally it does not at first recognise the people who come to the bedside, but shrinks from them.

Questions asked at such a moment are often productive of no result whatsoever. The child says merely, " Something frightened me. I do not know what it was." An older child will say, " I forget," and we, knowing how we ourselves have waked in terror in the night, certain that we have been dreaming and yet unable to recall the dream, can readily believe him. Still older children are often able to give details of the terror dream. Rarely, however, are we able to get details from a very young child. When we remember that it is only in very young children that we are able to find the simplest wish-fulfilment structures, we are inclined to believe that it is desirable that we should obtain the terror dreams also of very young children, since in them we ought to be able to discover the simple structure which later becomes elaborated into the nightmare and kindred dreams; and from them learn what precisely are the essential elements of such dreams.

I recently had the good fortune to meet with an instance of a terror dream as dreamed by a child of two-and-a-half years of age. I was further able to obtain a very full record of the events which preceded it, in the light of which I was able to understand, not merely this dream, but certain points that had, till then, refused to make themselves as clear to me as I wished. All that I was able to discover from this dream, however, was in harmony with what I had already surmised as a result of the study of the dreams of ex-soldiers, including a number of my own.

The girl in question is the middle member of a family of three, living in a quiet village. The father's occupation takes him from home for long periods, so that usually the family consists of the three children, the mother and a maid. The steps between the children are in each case approximately two years. The events occurred when the youngest child of all was a baby of a few months old.

The oldest child is a boy. From her birth he was extremely jealous of his sister, since she deprived him of a unique place in the household and in his mother's affections, and he has constantly endeavoured to assert his superiority by insisting on the inferiority which he regards as the inevitable concomitant of his sister's sex. " You ought not to do that, because you are a girl," he says on many occasions and in many ways. He worries his mother to send him to a " proper " school, by which he means a school in which there are no girls. He denies his sister access to his toys, since these are " boy's toys," and she ought not to play with such. Naturally, she has acquired a preference for such toys, and has asked for them.

Trains have been given her. But these raise constant difficulties in the nursery. The brother wants to monopolise them. The little girl is allowed in consequence to keep her trains in the woodshed, a building in the garden, but neither she nor her brother is permitted to visit this without express permission.

One day a visitor discovered when she arrived at the house that she had been followed from the village by her dog, a large black retriever. The creature is quite unfitted for drawing-rooms, and his mistress thought it wiser to shut him in the woodshed before she rang the bell: an easy matter, since she knows the house and grounds very thoroughly. She forgot to mention the dog, and in the course of the afternoon forgot him altogether, so that she returned to her home, leaving him still fastened up in the woodshed.

Later on, the little girl, seeing that her brother was occupied with his toys and her mother with the baby, realised that a chance had come for her to slip away in secret to the shed and play with her trains. She went away very quietly without attracting the attention of anybody, made her way into the garden and opened the door. At once a frightened and hungry dog, seemingly immense to such a tiny person, leapt out. The child screamed in terror and ran towards the house.

The experience was a painful one, but it brought about immediate desirable results which the child could not possibly have anticipated. She was not punished for her disobedience in going to the shed without permission. The baby, of whom she is jealous (as her brother is of her), was laid aside by the mother, who devoted all her attention for the time being to the terrified daughter. The brother left his toys, and tried hard to comfort the sister whom he generally repels. In brief, every difficulty of the child's little world disappeared as a consequence of that instant of terror.

Since that time terror dreams have repeatedly occurred, from which the child awakes screaming. Once, quite recently, she jumped from her bed and, still asleep, ran to her mother's room. The dream is invariably the same, so far as I was able to gather—a big dog is jumping up at her.

Such a dream might very well be taken as an illustration of the failure of the "wish fulfilment" theory. Is it possible that the child wishes that a dog will jump at her? It is necessary, in replying to criticism of this kind, to emphasise the fact that we have not the whole dream before us. The dream has been cut short by a sudden waking. In the particular instance that we are considering, the events which preceded the dream enable us to say with confidence that if the leaping up of the dog does not in itself fulfil a wish, it is the prelude to a wish fulfilment. The dream

is, however, unable to proceed to an end, because the emotion stirred up by the introduction is so strong that sleep comes to an end. An analogy is provided by the book which a nervous reader finds himself compelled to set aside after he has read a few opening chapters.

It is possible to see at once the difference between a dream of this kind and the "satisfying" dreams of infancy. In the latter the child deals with the actual wishes of his everyday life, and ignores the people who frustrate these, the weather that postpones them, the time that intervenes before they can be realised. He ignores externals. He is able to do this because these externals have not yet for him acquired a "meaning."

The little girl would find no difficulty in abolishing the dog in other circumstances. Were it, for example, a dog guarding a tree she wished to climb, I have no doubt that one night or another she would dream that she were climbing the tree, and in such a dream no dog would appear. But the presence of the dog is essential to a certain body of wishes, in connection with which he is not something that stands in the way of their realisation. It is only because she was frightened by him that these wishes were fulfilled.

If her sleep were not broken, it is probable that the dream would proceed to a happy ending. The perception of the dog, however, arouses the emotion of fear. Sleep comes to an end, and the dream cannot proceed. The terror dream, therefore, would appear to be *the statement of a condition of wish fulfilment;* not the fulfilment itself.

The difference between the two types of dream considered may perhaps be made clear by the statement of each in the form of a sentence with a conditional clause—

(*a*) If next week were here, I should be at the seaside.

(*b*) If a dog would jump at me, mother would make a great deal of fuss of me.

The young child, for whom time has not acquired any great "meaning," may easily abolish a week, and in consequence dream that he is by the seaside. An adult, with his week planned ahead, cannot deal in this cavalier fashion with time. Before the time to go to the seaside arrives for me, I have duties to fulfil, engagements to keep, so that if I should dream myself already by the sea, I should expect that the dream would not give me the unalloyed pleasure it gives a child. But even for the infant, the difference between the types of dream is very great, inasmuch as though the child is able to deal with externals in a detached fashion, it cannot disregard its own emotions. The difficulty that stands in the way of wish fulfilment is an internal one.

A girl of fourteen entered a secondary school at the same time as her brother, who was two years younger. His preparatory training had been a great deal better than hers, so that the two were placed in the same form. When she was little more than a baby, the girl had been impressed very unfavourably by the remarks of older sisters about the school, in which they were at the time pupils. Later, when her mother told her that she, too, was to attend this particular school, the girl pleaded with tears that she might be sent to another. Her mother was obdurate, and the girl came to the school with the idea in her mind that she would do very badly. Her brother, on the other hand, was determined to do well. At once the girl was placed in a difficult position, since her doing badly could not reflect on the school, and would merely have the effect of humiliating her, in view of her brother's success. She began to behave badly, hoping that the headmaster would request her mother to send her to another school. He, realising her purpose, dealt with the matter in other ways.

At this time she had a number of dreams which represented her mother as dead. From these she awoke weeping. In reality she was very fond of her mother ; bearing a grudge against her only, so far as I know, in connection with the school. It is, nevertheless, the fact that her mother's death, and that alone, would have secured the girl's immediate removal from the school. Here again, therefore, as in the previous dream, we are presented with a condition of wish fulfilment rather than with the actual fulfilment. Here also the perception of the material elements of the condition provokes an affect which ends sleep.

A boy of about twelve dreamed that he was in the railway station about to go away with the family for the annual holiday. The train with his father and mother, his brothers and sisters, on board ; leaving him alone in the station. He awoke, feeling miserable and wretched.

An examination of the dream showed that the boy found it extremely difficult to carry out any of his own plans, since his father or mother, his brothers or sisters, interfered so much. He wished that they would leave him alone. The dream expresses the condition of such a fulfilment, which is that all these interfering people should go away. It stages the one occasion when the members of the family all go away together. But " being alone " is doubly valued. Although it makes possible the realisation of cherished plans, it evokes feelings of fear and of loneliness. Jealousy, too, comes into play, perhaps, suggesting that whilst he is away from his family, he may be missing something which they are enjoying.

In such considerations, it would appear, we have the explanation of the reason why dreams of the purely infantile type, with obvious wish fulfilment, are rare in adults. The things which stand in the way of wish fulfilment have acquired " meaning," each of them standing for us as part of a unity. Many of them stand in the way of fulfilment of certain wishes, but are essential to the fulfilment of others. They cannot be modified or abolished in the dream, without the evocation of appropriate affects.

In this connection, a remark may be made in passing in connection with the " exhibition " dream, in which the dreamer appears wholly or partially nude, or dressed in fantastic or ill-assorted garments. The affect in such a dream is generally unpleasant in tone. Very frequently the dreamer passes through crowded streets, or stands in a public place in the presence of many people. The other people of the dream are dressed in ordinary clothes, and none of them remark anything unusual in the dreamer. Upon this he congratulates himself. The dream, therefore, represents an unusual attitude on the part of the public, inasmuch as it ignores what it would ordinarily remark upon. *If public opinion ceased to exist, the way would be clear for the realisation of a great many egoistic and antisocial desires.* But the ignoring of the dreamer's existence by great numbers of people is humiliating to him, especially in view of the fact that the dream shows him acting in ways that are expressive of self-assertion. Consequently, the pleasure that he should feel because he is proceeding towards wish fulfilment is mingled with the unpleasure that comes of unsuccessful instinctive activity. The resulting conflict of affects is the feeling of " anxiety."

The ex-soldier's post-war dreams often represent the " no man's land," and he wakes from this presentation with horror. Very seldom, so far as such dreams have been narrated to me, does the dreamer definitely act. He claims, often enough, that the scene pictured is " as it really was," and that no details are omitted. Such statements, which obviously cannot be checked, should be received with the greatest caution. For " as it really was," "as I now remember it " should always be substituted.

It is clearly impossible for a civilian, or indeed for anyone who has not had some direct experience of life in front-line trenches, to understand the outlook on the " no man's land " of the private soldier. Very few officers, I imagine, could have known it fully, since I have heard many things said in the trenches which could not in any circumstances be communicated to an officer. The relations between men were very different in the trenches from what they were at the base, and I understand that they were

still further modified when "over the top." After the usual bluster from the sergeant-major, a man said to me, "He won't talk like that to us chaps when we're out there. He'll be like a lamb then. He knows what he'll get it if he isn't. The truth in fact of such a statement is not important; its value lying in the light it throws upon an attitude towards the "no man's land." There was a sense, I discovered, in which men at times actually looked forward to "going over"; and certainly numbers of men always went from the trenches to "rest camps" with very mixed feelings. In fact, there is something in common between the attitude towards "going over" and that to which Kipling refers when he says:—

"Put me somewhere East of Suez,
Where the last is like the first:
Where there ain't no ten commandments,
And a man can raise a thirst."

Anyone who cares to imagine the ex-soldier engaged in a quest for work, finding all available jobs held by men who had safely stayed at home on some pretext or other, will realise what the restoration of no-man's land conditions must imply. An ex-non-commissioned officer and an ex-colonel sat not long ago at the same table with a vulgar little man who could talk of nothing but his cars, and who had done very well out of selling underclothing to munition girls throughout the whole period of his "exemption." After he had left the table, the remarks of the two men were pointed and pertinent. And I have heard an ex-soldier commissionaire say to a man who was giving him trouble, "If I only had you in the Army!" In exactly the same way, the ex-soldier, confronted with difficulties, baffled by regulations of various kinds, is compelled to think of the region in which men were protected by nothing but their own strength and daring, their courage and skill.

Detailed understanding of a dream is impossible without some knowledge of the dreamer's associations with the elements of the dream. In their general characters, however, war dreams present close affinities with the childish terror dream, and may be easily understood in their main outlines if we regard them as *conditions of wish-fulfilment*. Every difficulty which peace conditions present would disappear in the "no man's land." Questions of earning money would no longer present themselves, the weak would no longer withhold things that are desired. Man returns to

"The good old way, the ancient plan—
To let him take who has the power,
And let him keep who can."

As soon, however, as the trenches or the battlefield appear in the dream, the danger instincts evoke affects which bring dreaming to an end. They seem to play no part in the formation of the dream, which would appear determined, if sleep were not disturbed, to proceed as inevitably as a magazine story to a "happy ending." Wish-fulfilment seems to be the whole purpose of the dream, and is absent only when the dream cannot proceed to a conclusion. Sleep is disturbed or broken when profound and unpleasant affects are evoked by the elements of the dream presentation.

This conclusion inclines us to look to instincts which persist in spite of fear and humiliation towards their goals, as those which are the prime, if not the sole, cause of dreams. At once we are compelled to think in particular of hunger and sex. Both instincts have a close connection with sleep, which follows their satisfaction, and is different in nature from the sleep of fatigue which follows the exertions in connection with danger instincts or curiosity. The organisation of the modern world, and the social circumstances of the majority of men who come into contact with physicians and psychologists, ensure that, through the latter, very little material connected with hunger dreams will come to notice, and through the former, hunger dreams will not occur in the case of the greater number of mankind. It would not be surprising, however, to learn that self-assertion played a very considerable part in the making of dreams, although, as we have already seen, the affect of humiliation may disturb sleep, and probably bring the dream to an abrupt termination.

The forces which tend to restrict the sexual activities of men at the present day are religious, social and economic. The dream of the infantile type might calmly abolish one or all of these, but few adults could view without apprehension the disappearance of the religious, economic or social systems of their time. All have acquired a meaning for us which makes us wish to retain them, even though in certain respects they limit our freedom. Thus, we love our chains. A man may be so urged by desire that he may risk public opinion, may seek haunts and associates which are normally repugnant to him, and may strive to ignore considerations which otherwise weigh with him. The resulting conflict may express itself in dreams which can hardly be of the simple wish-fulfilment type, but which may range from simple anxiety dreams to nightmares accompanied by the extremest terror.

The part played in dreams by the existence of a current conflict has never been minimised by Freud. It is clear, however, that we know little enough about any man's mental conflict when we know little more than the names of the opposed elements. The conflict *duty v. gratification*, depends upon the "meaning" these terms possess for the subject, and this again upon his history. It is clear, also, that early presentations of "duty," say, by means of concrete objects and particular instances in infancy, rather than later discussions of an abstract character, will determine the objects which are used in the dream which endeavours to set forth the ignoring of duty in the quest of gratification. It may be that the endeavour to ignore the claims of religion will be represented by a picture of a world in which religion no longer holds men, and the nature of this representation will depend entirely upon the "meaning" of religion for the dreamer.

It would seem then, that the dream aims at the direct gratification of such tendencies as hunger, sex, and self-assertion. In real life, the preparation for such gratification is vigorous in character, and its attainment is followed by rest or sleep. If external obstacles intervene, the dream endeavours to ignore them, and is able to do this successfully, provided no sleep-disturbing affect is evoked. In the latter case we are presented with, not a dream, but the fragment of one.

It is beyond the purpose of this paper to touch upon the question of the disguises of the dream. With the bulk of Freud's work in this connection Rivers seems to be in agreement, though he differs from Freud on the question of symbolism. The subject is too great a one to be touched on here. Nor can we further touch upon the view of Freud, from which Rivers appears to dissent, that every dream has its roots in infancy. There is little doubt in my own mind that the British public dislikes Freud, or is at least hostile to the way in which he has presented his findings; and that, on this account, there is a tendency to accept uncritically a great deal of what Rivers has written. I have been concerned principally in this paper to show that I believe that Rivers' attempt to show the failure of the "wish-fulfilment" theory introduces an unnecessary confusion into the study of the dream, and that the theory is wide enough to include within its scope dreams of a character which Rivers believes should be excluded. I believe, further, that the "wish-fulfilment" is a particular instance of the "attainment of purpose," and that dreams, considered from this point of view, show in a particularly striking and helpful way that purposive character which they possess in common with all psychic activities whatsoever.

KNOWLEDGE AND FEELING

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I wish in the following article to investigate briefly some aspects of the problem of the relations between knowledge and feeling, a subject on which a good deal of confusion exists, not only in popular speech, but among philosophers themselves.

In ordinary conversation the term "feel" is continually used to denote a certain kind of knowledge, principally of the sort called immediate. We say, "I feel that these two colours do not blend," "I feel that he is not doing himself justice," or "I feel that what you say is true." To this kind of knowledge the term "intuition" is not incorrectly applied, the term "intuit" meaning very much the same thing as "perceive." When we say that we "feel so and so to be true," we mean that we more or less know it to be so directly, although we may not at the moment be able to give our reasons for it. In ethics the term "intuitionism" is used to denote the theory that we know the right and the wrong (the older theory) or the good and the bad (the more modern theory) by simply looking at these, and apart from reasoning about them.

The terms "intuition" and "feeling" being used in popular speech to denote pretty much the same thing, the question arises as to their relationship. It does not, to be sure, matter very greatly to philosophers if common speech is confused on the subject; but philosophers themselves have differed in this matter, as we said. On the whole by far the strongest tendency has been to accept the conventional psychological view, that feeling is a distinct mode of consciousness from cognition, and to deny that knowledge, even of the "intuitive" sort, can be identical with feeling. Is this so? If it is, can we explain the obstinate and persistent belief that feeling is a kind of knowledge? This is our problem.

In the interests of accuracy, psychologists have generally given to the term "feeling" a very specific meaning. It is usually identified with the pleasure-unpleasure aspect of experience,

cognition and conation being the other two main aspects. Thus we have cognition, conation, and feeling *or* pleasure-unpleasure.

I have elsewhere[1] criticised this view of feeling as identical with the pleasure-unpleasure aspect, and although I do not wish to concentrate here upon this criticism, it is necessary to recapitulate it very briefly and somewhat dogmatically, as upon this depends the subsequent theory of the relation of knowledge to feeling. The theory is, in a few words, that feeling is the subjective aspect of a *whole* situation, in which a conscious organism is together with a portion of the objective world. The chief distinction between this view, necessarily rather abstractly stated, and the normal view, is that it makes feeling something more than one of three modes of experience side by side with two others. Feeling, on my view, is the subjective aspect of the *whole* situation, the cognitive-conative relation of subject to object, and it takes on a specific *concrete* character in each case, according to the nature of our cognitive-conative relation to the object. This concrete character is specifically denied by many psychologists who maintain that feeling can only vary in intensity and not in quality. This is a mistake, it seems to me, and it is of course the corollary of the afore-mentioned abstraction and identification of feeling with pleasure-unpleasure. Feeling should not be thus identified; rather is feeling the substantive of which pleasure and unpleasure are adjectives or characters or qualities. The term hedonic-tone is useful: but hedonic-tone is a *character* of all feeling, and is not the *same* thing as feeling.

Let us explore a little further the notion that feeling is the subjective side of a whole situation. In saying this, we divide experience itself into two main factors, a more subjective and (what may, with some disadvantages, be called) a more objective, *i.e.*, feeling on the one hand and cognitive and conative reactions towards the object on the other hand. In speaking of the objective side of consciousness, it must constantly be kept in mind that cognition and conation are different ways of adaptation to the objective world. Apart from the object they are meaningless, and it seems to me that a good many artificial problems in psychology have been raised owing to the attempt to treat psychological processes as ends in themselves, and not as transitive processes finding their meaning and end in the adaptation in one way or another, by a subject to an object. If this is so, if the meanings of cognition and conation are to be explained in objective terms rather than subjective, if, *e.g.*, the meaning of instinct is to be

[1] Journal of Philosophy.

better understood by an objective examination of behaviour rather than by mere subjective introspection, it follows that feeling, which is the subjective side of the whole situation, will also derive its meaning and character from the transitive cognitive-conative relation to the objects. Feeling is not, literally speaking, itself a direct reaction to an objective situation, but it is the subjective side of that reaction, it is concrete, and its colour and character will vary in each individual case according to the character of the objective factors.

To make this a little clearer if possible let us discuss the effect upon feeling of two different types of reaction to an object, first the more purely instinctive type, and second, the more objective type of knowledge. Conation and cognition are invariably present at all levels of life, but they may be differently stressed. In the animal the active conative adaptation is prominent, *e.g.*, the impulse to fly when afraid, to fight when angered, etc. If in our own experience we think of instinctive situations, we find that we should describe, for want of a better term, some of these feelings as " violent," and this is simply owing to their being the subjective side of conative objective adaptations. If on the other hand we take the case of our experience at what may be called a higher level, the level where we are able to contemplate and to know things more or less as they are, and not merely in relation to our practical needs, then we find that although there is a subjective side, or feeling, of ideating and of striving to know, which subjective feeling is pleasant or painful according to (a) the harmony or disharmony of our ideas, and (b) the success or otherwise of our striving to know,—yet the feeling is, on the whole, of a " quieter " sort. Where there is great excitement in knowing this will be found due to the excitation of some instinctive impulse. The passionlessness and " coldness " of " pure " knowledge has often been commented upon. The ideal of " pure " knowledge, were such conceivable, would be realisation of the idea of the object in us in its full cosmic significance. " It thinks in us," said Aristotle. But this ideal of course is never realised.

To sum up this portion of the argument : we may say that in the instinctive situation the feeling has its strength and its peculiar concrete character owing to its being the subjective side or feeling of relatively powerful conations, whilst feeling in more objective knowledge is not marked in exactly the same way, but is of a " quieter " sort, being the subjective side of a harmony of ideas. As, however, finite knowledge is always also an active interested process of striving to know better, effort which is marked

by greater success or failure, there is always some pleasant or unpleasant feeling present. If reason is thought to be "cold" it is only because objectiveness of thinking is the ideal of knowledge. No reasoning ever took place without some interest or end, the attainment (or otherwise) of which implies some feeling.

Having given the above very general outline of what is meant by saying that feeling is the subjective aspect of a *whole* cognitive-conative situation in relation to an object, let me now explore briefly, as previously suggested, the relation of feeling to knowledge of the direct sort, sometimes called "intuitive."

It is sometimes supposed that "intuitive" knowledge is of a higher sort than the knowledge which is attained by scientific reasoning. We speak of the intuitions of the poets, of the mystics, of the men of religion generally, and contrast them with the more laborious work of logical and scientific reasoning, often to the disparagement of the latter. On the other hand, the scientist in his turn may also have a contempt, sometimes ill concealed, for the "so-called intuitions" of poets and mystics and madmen. For him the one and only criterion of truth is its coherence, its "fitting of the facts." Particular phenomena must, he says, be explained in terms of a system. It is, of course, quite easy to show that the reasoning of the scientist must come to rest somewhere in the self-evident. For example, mathematics is based upon axioms, the truth of which is directly or intuitively apparent. But this is not quite the point which I wish to develop. The point rather is that both methods of approach to reality are necessary from the mere point of view of knowledge. The so-called "feelings" of the poet and the mystic are not *mere* feelings, which, were it conceivable that such should exist, would be *merely* subjective, nor are the judgments which are the outcome of the "feelings" merely subjective judgments. They have some claim to truth, I shall try to show, even in so far as they are the outcome of feeling, just because feeling is the subjective aspect of a *whole* situation of a subject cognising (and striving in relation to) an object. It is true, on the other hand, that the judgments which are the outcome of feeling must be tested in the usual scientific way by correlating them with the system of truth, but they are judgments which would never be arrived at were it not for the pioneer work of feeling. We may contend that all knowledge is an outcome of this knowledge through feeling (whatever it may mean), and that scientific procedure is merely a testing and a correcting of the partial truths so presented in some way through feeling.

To make this rather abstruse contention a little clearer if possible, let as analyse the process of the development of *e.g.*, a piece of

philosophical knowledge, from its dark beginnings to its clear consummation, and afterwards return for a moment or two to the poets and the mystics, in order to discover their place as " feelers after truth " in the search for knowledge.

Let us take the philosophical question, What is the good or ultimate value of life ? which leads on to the still more ultimate question, What is the good or value of reality ? When the primitive or untrained thinker approaches this question he first tends to pronounce that to be good, or to have value, which gives him immediate *satisfaction*. And satisfaction being very much the same for the undiscriminating mind as " pleasure-experiencing," it comes to be that one of the earliest types of ethics is hedonism, or the doctrine that the supreme good is pleasure. Here are the intuitive judgments " pleasure pleases me ; it is good to be pleased " ; and the logically invalid conclusion " pleasure is *the* good." Very little further reflection, however, soon suffices to show that this dogma is inadequate. What pleased the agent an hour ago may be the direct means of pain to him now. If he reflects at all there will be at first a vague confusion of two ideas at the back of his mind, accompanied by a *feeling* of disharmony or something wrong. If he pursues his reflection, analysing and comparing, he may arrive at a further general proposition, which seems to him at this stage to be satisfactory, *e.g.*, " To pursue the pleasures which do not cause subsequent pain is the good." As his experience widens, and he comes to know directly the value of altruism, there will appear a further *feeling* of disharmony and dissatisfaction with the previous narrow formula, followed by a further attempt to find a truer formula and to express it in clear intellectual language. If he still continues to be a hedonist he may say, not that the individual's pleasure is the good, but that, for example, the greatest pleasure of the greatest number is the good. My point in referring to these examples of development in ethical thought is not to concentrate upon the content of that thought itself, but rather to show that, negatively, a *feeling* of disharmony of ideas, and of dissatisfaction, precedes in each case the attempt to readjust intellectually in terms of a wider system : also that, positively, the readjustment towards a more harmonious philosophy may be made in the first instance by a *feeling* of the harmony of a new idea tentatively put forward with the system of ideas already present. The feeling is not sufficient in itself as a criterion of truth—that must be tested by logical coherence—but feeling may, so to speak, be a pioneer, guiding us into new countries of speculation by signs which it would be impossible to express in intellectual language, but which are not therefore of the less value in their own place and

time. We might pursue the above example further, and point out that the discovery that pleasant feeling is not a true good at all, but that " satisfaction " depends upon some system of functioning which can be described in objective terms, that this system of functioning, or human life, can only in its turn be understood in the light of a universal purpose or intrinsic value which is the life of the Universe itself—that all these things are first discovered both negatively and positively through the feelings which are the subjective side of our cognitive-conative processes.

If the above arguments seem too obvious, it would be remembered that most psychologists would not sanction our use of the term " feeling " which makes them possible.

I have chosen above the particular example of the philosophy of values, but the same thing could be demonstrated, I imagine, with the philosophy or science of fact. There is a sense in which it is literally true to say that the scientist " feels " his way towards a new hypothesis, and history shows that the hypothesis thus made is often justified by the intellectual test. But we should be quite clear as to the relation of feeling and knowledge. It is *not* true to say, as is often said, that feeling *is* knowledge. We may, if we care, use the term " intuition " to denote immediate, unreasoned knowledge, but if we do so we should be quite clear that though " intuition " is closely related to feeling, it is not identical with it. When we say that the scientist " feels his way " towards a new hypothesis, we must remember that his attitude towards the objective he is exploring is one of cognition. Because feeling seems to be confused, it has been thought that confused knowledge is the same as feeling. But the objects of knowledge which the scientist or the philosopher has before his mind are still objects of *knowledge*, however nebulous and however vaguely related they may seem to him. Feeling, on the other hand, is, as we said, not the cognition, but the subjective side of it which we experience directly in the act of transitive knowledge of objects. It is the concrete subjective feeling of vague confusion or vague harmony (the feeling of this confusion being more or less unpleasant, and the feeling of harmony being more or less pleasant) which leads us to retreat or to advance in the process of forming hypotheses. If the concrete feeling is strongly unpleasantly toned, we retreat, much as the sea-anemone shrinks away when prodded ; if it is strongly pleasantly toned, we advance with some confidence. But always, of course, as we said, the hypothesis must be tested by the laborious intellectual process of analysis and synthesis, to see if it fits the facts. Reason confirms or rejects in its " cold " way the hypotheses formed under the guidance of feeling.

So the questions we asked to begin with are in part answered. Though we do not directly *feel* that a thing is true, but *think* that it is true, or *know* that it is true (in the sense of " know " which includes the possibility of false knowledge), yet there is a harmonious feeling which is the subjective side of the cognition that " it is true," the existence of which gives a peculiar poignancy to the popular phrase.

In the above analysis I have perhaps seemed to speak as if cognition could be separated from conation. This, of course, is not so, and the close connection of conation with knowledge and feeling is important in the metaphysics, as in the psychology, of the matter. Apart from the immediate pleasure in attaining our end in the active process of truth-seeking, there is a delight in the sheer harmony of objective reality which the insight of truth reveals. Is this delight " pure " and completely " disinterested ? " Hardly ! It is a delight in a reality which is felt to be the home of our endeavours. There is pleasure because through increasing comprehension of, and familiarity with, the nature and purposes of reality we become the more masters of ourselves, who are but one expression of reality. Knowledge is power, not only in the sense that it gives us mastery over the physical forces of Nature, but in the sense that through understanding of the inner meanings of reality we come to understand better the meaning of our own existence, and so are able better and more rationally to direct our actions. The philosophy which contends that we are first and last practical beings seems to me true. If it is, then the satisfaction with truth and the dissatisfaction with falsity can perhaps in the end best be expressed in conative terms.

We have spoken of feeling as a " pioneer." The common dispute as to whether " felt knowledge " is more or less advanced, is higher or lower, than the clear analytic-synthetic knowledge of philosophy and science, depends upon our point of view. At any given stage of knowledge there is a focus of clear analytic-synthetic knowledge : on the horizon there are worlds unexplored of which we have but the vaguest notions. If in reference to what is clearly known, or what can be known with a little trouble, we substitute " felt knowledge " or " intuition " for the harder work of analysis and synthesis, and are content to rest there, then intuition is a slovenly substitute ; it is " lower " than analytic-synthetic knowledge. If, on the other hand, in reference to the relatively unexplored, we apply our " intuition " as a step in knowledge, and allow ourselves to be " led by our feelings," we are only doing what must be done. Intuition is in this case " higher " than intellectual knowledge in the sense that it goes beyond the range

of present clear knowledge. Feeling is thus a pioneer: it guides intuition towards new realms of being: and pioneers must be honoured as such. But as knowledge develops, pioneer methods have to be given up, or we are substituting the less developed for the more developed.

So the poets and mystics are the pioneers of life, and are to be honoured for it. The scientists and the philosophers are the settlers. We must not, of course, suppose that the end of the poet and the mystic is merely to discover knowledge. It is their function also to realise the *values* of beauty and love, values which are distinct from intellectual or truth values. Nevertheless for philosophy particularly (as opposed to science), for philosophy which takes all values into account, the experiences of the poets and the mystics are important material. They of all men are sensitive to wider spheres of being and experience to which the man of common mould is blind and deaf. What the poet feels is of the highest importance, and from the mere point of view of philosophical knowledge his intellectual expressions are to be treated with respect. When these concern the great simple value—facts of experience, of beauty and love and goodness, his judgments are least likely to err. When, however, he turns philosophic, his ideas, although respectable as suggestions and hypotheses, are to be treated in a more cautious way. When he turns philosopher altogether, as Browning did, his *dicta* must be judged by the ordinary criterion of philosophy, namely, coherence.

So in the end there are not two sorts of knowledge, feeling and reasoning; there is but one sort, knowledge. [1]At its earlier stages, or in reference to the comparatively unknown, feeling is the mode by which we know its relative coherence or incoherence. At its later stages, or in reference to what can be more clearly known, reasoning and logic are the only valid tests.

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[1] In saying this, I do not wish to blur the most important distinction between knowledge by aquaintance and knowledge by description. This distinction is, of course, closely connected with the above problem, but may for present purposes be separated from it.

AN INTERPRETATION OF TRANSMIGRATION

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A spiritual danger is supposed to be lurking in a life of activity. In India, at any rate, it is a common-place belief that, somewhere in this activity, there is an element which, somehow, binds the soul to the ever-revolving wheel of birth and death. The man in the street is not alone in this matter ; teachers of religion, preceptors of morality, and expounders of thought, share in this belief ; the orthodox thinkers as well as the heterdox accept it without demur ; and every philosophical system explicitly professes to be a remedy for transmigration. By suggestion, imitation and repetition, the doctrine has taken so strong a hold in the mind of the unsophisticated Hindu, that he has come to accept it as almost an axiom of life. It is not astonishing that an effort was made, in recent years, to include the belief in transmigration, as one of the essential elements, in the definition of the word, " Hindu."

But the modern student of Comparative Religion has permitted himself to be an unconscious victim of an illicit generalisation ; consequently it has not been possible for him to be fair to this venerable belief, nor even to be just to it ; on the other hand, he has been led into the fashion of calling it primitive and then dismissing it from consideration. He does not seem to have realised that, though there is a superficial resemblance between the two, the belief in transmigration, as held by the Hindu, has little in common with the belief as held by the Hottentot or by the inhabitant of Zulu-land. When giant thinkers like Kapila and Sankara, who had the courage to override the authority of the Vedas, in face of popular opinion and at the risk of social ostracism, and who had fundamental differences in religious and metaphysical matters, nevertheless agree in this belief, their view has to be respected and considered seriously. As a preliminary to estimating the value of the doctrine, it is necessary to restate it, to clarify the issues involved in it, and if possible to offer an intelligible interpretation of it.

Unfortunately the doctrine of transmigration has been generally mixed up, and confused, with another interesting doctrine, that

of *Karma*. The latter is ethical in character ; it is based on a theory of value ; it involves questions of merit and demerit, of reward and punishment ; it is, above all, an attempt to express the way in which divine justice is immanent in human deeds ; it is, in short, a philosophical formulation of what St. Paul meant when he said, " as you sow, so you shall reap." The former, on the other hand, is the statement of a natural law. That the soul has the tendency to pass through certain experiences, under certain circumstances, is as much a law of nature, as that a body continues to move in a straight line, unless interfered with by some other body. The two doctrines are distinctive, and belief in one does not necessarily involve belief in the other. As a matter of fact, there are people who believe in *Karma* alone ; there are others who believe in transmigration alone ; there are others, again, who believe in both ; and there are still others who believe in neither. The followers of Buddhism, and to some extent, of Christianity, believe in *Karma*, while not believing in transmigration. Yet confusion is possible, and even likely. Both the doctrines have a common factor, viz., action, as one of their foundational elements ; it is, therefore, natural for an unthinking mind to consider that there is, somehow, an intimate connection between the two. When, further, it is discovered that the doctrine of transmigration is probably the psychological basis of the doctrine of *Karma*, and, conversely, that the latter is the application of the former in the sphere of moral life, the confusion becomes more natural.

Even the verbal statement of the doctrine is not without its defects. The unreflective man, who is not expected to have a special regard for accuracy of expression, calls it " The Transmigration of the soul " ; the student of comparative religion, tainted, in this respect, with the vice of superficiality, borrows this phrase, and, mistaking metaphor for reality, accepts it as the correct statement of the doctrine. The phrase has, no doubt, the charm of simplicity, and, in addition, it has a picturesqueness about it ; in the hands of a popular teacher it may even possess a certain rhetorical force ; but from the point of view of the thought which it is supposed to embody, it is very deceptive, and is likely to mislead the inquirer. It would suggest that the soul moves from body to body, in endless succession ; and, to be sure, it would involve a self-contradiction. If, at the time of death, the soul leaves the corpse, and enters into another body, this body must be, from the nature of the case, either a corpse or an embryo. That it is not a corpse is obvious enough ; that it cannot enter into an embryo is also clear from a little reflection, for if an embryo is human and living, it must be already in the possession of a soul.

Thus the doctrine, as popularly stated, would involve a self-contradiction. Whether, in spite of this contradiction, this belief is actually held by any is not here in question ; but the Hindu's belief is not so simple, so absurd, and so contradictory. What he believes in is not so much the migration of the soul from body to body, as the constant modification of a body, which the soul is supposed to possess. A change *of* body is one thing, and a change *in* body is altogether different. If the soul migrates at all, it also carries, like the snail, its house on its own back.

Nor has the nature of this body been clearly understood. The word ' body ' suggests, by virtue of constant association, the idea of something which is gross, material and tangible. Support has been lent to this suggestion by modern psychological analysis. According to this, man consists of certain psychical experiences, states, and conditions, collectively named " the internal-self," and of a material structure, called " the body " ; either the soul does not exist, or it is identical with the internal-self. A mind trained in modern psychology, and habituated to this way of thinking, would naturally conclude, when it comes to consider the problem of the transmigration of a soul, that the body involved in this process is only the material body. The Hindu thinks in a different way. According to his metaphysical psychology, man is a soul and *Prakarti*. This latter factor is Nature ; it includes what modern psychology calls " the internal self " and the gross body ; and it is this complex combination which is, indeed, the body of the soul.

This Nature has three constituent principles, viz., Purity, Mobility and Inertia, inherent in its very composition ; and it is due to these that it evolves into mind and body, as popularly understood. In the conception of a primordial and undifferentiated stuff, out of which all psychical and physical elements are manufactured in the making of man, Hindu thought approximates to the modern biological view. Subconsciousness ; consciousness and self-consciousness ; the internal organ called mind, the sense-organs, and the organs of action, the proto-elements out of which the physical body is evolved, and the physical body itself ; these are the forms into which Nature develops in the course of its evolution. All these forms, except the last, constitute the inner sheath or the subtle body of the soul ; and the physical body is, as it were, only a product evolved by the subtle one, out of the proto-elements already contained in it. In addition to this evolution, Hindu Psychology postulates an involution ; and both processes are believed to be controllable.

Leaving aside the interesting details of this evolution, as being

not quite relevant to our purpose, let us dwell, for a moment, on the relation between the subtle body and the gross body. The condition of the development of the gross body, out of the subtle elements, is that the subtle body should be dominated by the principle of Inertia ; then commences the gravitation towards matter. An analogy will be helpful in visualising this relation. As the snake develops an epidermis, or as the spider produces a web, so the subtle body evolves the gross one ; as the snake peels off its skin at stated intervals, or as the spider abandons its web after a time, so the subtle body relinquishes the gross one at the time that we call " death " ; and as the snake developes a fresh skin, and the spider a new web, so the subtle body produces a material structure over again. This process of production and rejection goes on incessantly. To say that the soul moves from body to body is, therefore, almost as absurd as to say that the snake creeps into skin after skin, or that the spider gets thread after thread into itself.

But, in believing in the existence of a subtle body, Hinduism does not stand alone. Spiritism and Christianity, to mention only two, also involve this belief. The Society for Psychical Research, which includes among its members men of repute in Philosophy and in Science, has reported on spirit-phenomena from time to time. From these reports it would appear that the spirits of some departed persons occasionally make their appearances on earth. These spirits are said to have spoken and acted in a way which necessarily implies the presence in them of consciousness, memory, sense-organs, and the organs of action ; when they become visible, they look, it is said, exactly like their earthly prototypes ; but their bodies have nothing of the properties of the material bodies we know, so that they can pass through walls, or be shot through, or cut, without being injured in the least. Similarly, the Christian believes in personal immortality ; to account for the surviving soul's individuality of form, he falls back on the idea of the resurrection of the body ; since the soul's body in the other world is not tainted with the grossness of the bodies here below, he calls it spiritual. The conclusion is inevitable, that the spiritual body is a kind of subtle body. The difference between the Hindu thinker, on the one hand, and the investigator of spirits and the Christian believer, on the other, is that, while the former has made an effort to render an intelligible explanation of the constitution and nature of spiritual bodies, the latter do not seem even to have thought about the question.

Be this as it may, those who believe not only in the survival of life after death, but also in the return of this life to its earthly

conditions, are bound to tell us what it is in this life which accounts for this process. The average Hindu supposes that it is action; and his critic, in attributing to him an ideal of quietism, and in charging him with the weakness of a reprehensible passivity, also supposes that it is action. On the other hand, the ancient masters point to desire, rather than to activity, as the villain of this stupendous drama of birth and death; if they mention action at all, in this connection, it is only as a metonymy for the desire inherent in it. That this is so, is confirmed by the remedial formula that they prescribe to overcome the process of transmigration; and this formula is "disinterested action." Here, again, it is by taking the literal sense of what is intended only to be a figure of speech, that action has come to be understood as the cause of the process.

An ambiguity lurks in the word desire. In respect of an action, desire may, in the first place, function as the motive; in this case it is a representation of what is right; and it is unfolded, worked out, and consummated in the action itself. In the second place, desire may mean certain ulterior consequences, which the action is likely to bring about; in this case it is an idea of calculated profit; and it is not evident in the action. The distinction is obvious. It is the second type of desire that the Hindu teacher has in view, when he declares that desire is the cause of transmigration. Desires of this kind are conserved in the subconscious, or in the subtle body, as the Hindu would prefer to call it; and there it remains, till circumstances announce a resurrection and a recall.

That every kind of desire has the tendency to fructify itself has become almost a truism of the New Psychology. So much has been achieved by the study of the subconscious processes, so well has it been demonstrated that a desire, handed to the subconscious, has the fatal knack of expressing itself in practical life, that this fresh knowledge has come to be applied, with increasing success, in the details of every day life. We have come to recognise with a clearer understanding and a better insight than before how it is that what we are to be depends, to a large extent, upon what we have been. Psycho-analysis, which applies itself to the diagnosis and cure of mental disorders due to suppressed desires, and Auto-suggestion, which undertakes the constructive task of harnessing the subconscious to the needs of a healthy and happy life, are both based on the fundamental principle, that a desire once formed never dies, but transforms life itself in some way or other. In so transforming life, the subconscious, if so be it, is able to utilise all the conditions necessary for its success; and what is more astonishing, it has the power of even manufacturing the conditions,

if they are absent but necessary. The mechanism of this process is not yet clear ; the ancient teacher conceived it in his own way, and perfected a technique, not, indeed as refined as modern science would require, but sufficiently useful for his purposes ; and with this conception he was able to elaborate a theory, and with this technique to carry it out to its practical conclusions.

In adopting the theory of the conservation of desires, modern research in psychology has confirmed the conclusions of the Hindu thinker. But the modern mind, inclined by training and by tradition towards empirical phenomena, seems to part company with logic, and consequently to shy at the transcendental. The Hindu teacher, on the other hand, has the courage of his logic, and he is resolute and thorough-going in carrying out his principle. If the subconscious will, of a certainty, work out the desires conserved in it ; if it will not only use all the conditions, when available, but will also create them, when necessary ; and, if, at the time of death, the subconscious has many desires conserved in it--why should we shrink from the conclusion that death is no bar to the expression of the subconscious ? Again, if the subconscious could bring about such modifications in the material body as amount to a creation, why should it not continue its work even after the body is dead ? This question seems extraordinary. To the Hindu, who conceives the physical body as only the product of the subtle one, and who with his conception, has successfully explained the mechanism by which the subtle body is able to bring about modifications in the gross one, the conclusion is but natural. All but a few sceptics believe in life after death. If all the experiences, gained here below, are to be eliminated from the surviving life, what sort of life would it be ? If, further, the surviving life is personal, what would be the differentia of one personality, when compared with other personalities, if it be not the experiences it has accumulated in its sojourn in this world ? To these questions the most satisfactory answer seems to be the one given by the Hindu.

However, our curiosity has to be satisfied in one more respect. Granted that desires accumulated in this life will be worked out in the next life, why should it be in this world, rather than in any other ? But then we forget that the Hindu teacher does not posit transmigration for every one ; it is only those who have desires relative to this world that are bound to come back. Desires are realised in appropriate conditions ; the conditions appropriate to the worldly desires are only present in the world : *ex hypothesi*, a return to worldly conditions is necessary for the realisation of worldly desires. Accordingly, when death sets in, the soul with its subtle body withdraws from the gross structure, which it had

evolved for certain purposes, and begins to produce a fresh body suited to its altered nature. In entering upon this adventure, it seeks the appropriate time, place, circumstances, parent, nurture, and, in short, every detail necessary for a fresh evolution.

For this return to the world, the soul cannot escape responsibility. Ordinarily, no doubt, thought and activity belong to the subtle body, but in the making of a desire the soul has a substantial part. That element in desire, which makes it the representative of Self, and which gives it the character of a choice, is of the soul ; but for its consenting presence in it, desire would be a mere idea, or a blind impulse—something better than simple perception. Like a rider who is carried away by his horse whithersoever its equine energies may lead, and who knows, all the while, that he has only to pull the reins in order to bring the restive animal to a halt, the soul permits itself to be led away by the ever-energising subtle-body, knowing, all the time, that the whole process of the making of desires could be brought to a dead stop by one act of the " Determinate Reason."

When the soul refuses to identify itself with the intellection of the subtle body, and, instead, takes its stand on the " Determinate Reason," the situation becomes completely transformed. Action would certainly go on, but the soul's attitude towards it would be different. Instead of throwing itself forward into ulterior consequences, it would adopt the attitude of artistic contemplation ; consequently, action would be performed, not because of its tendency to bring profit, but because of its being right ; in other words, it would be disinterested action. In this manner, life could be purged of all worldly desires ; and with the vanishing of desires, the necessity for a return to the earth will also vanish.

Such, in brief, is the doctrine of transmigration, and such are the issues directly involved in it. When it is separated from the doctrine of *Karma*, and when the statement of it is shorn of all metaphor, and cleared of all ambiguities, it appears to be a natural law erected on the principle of the conservation of desires. Apart from its intrinsic value as a theory, it is capable of application to certain mysterious facts, which are inscrutable to human understanding. What is life, and what death ? Why should one man live to ripe old age, and another die in his youth ? Whence the innate inequality between man an man ? Why, in particular, should children die at all ? Have they not more right to live than the older ones ? Ever since the dawn of human reason on earth man has been asking these questions, but has been asking in vain. Are we any better for the doctrine of transmigration ? If looks as if we are. As a typical illustration of the application of the

doctrine, let us take the last of these questions, viz., the death of children.

One of the most impressive facts in human life is a child's death. It has brought about a spiritual crisis in many a parent, it has turned a few sceptical, and it has set many more in the path which leads to God. A child seems to have a celestial note about it; and with its innocence, love and faith, it looks as if it is marked out for eternity. But a slight cold, silly fever, and, alas, the child is no more! What could this mean? Cynics say that there is neither rhyme nor reason in the Universe, and that it is foolish even to raise a question. Is the cynic right? Would life be worth living, even for two minutes, but for the fact that there is an intelligence in the universe, and a reason behind it all? Philosophers are silent. Such of them as are persuaded that sufferings here are requited in the next world might say that the obliteration of an innocent will be recompensed by a special provision for it in Heaven. But why the wrong itself? All the allurements of Heaven, and all the visions of glory, cannot make an honest mind call wrong right. Founders of religion, prophets and teachers, seem to have realised the seriousness of the question; and the greatest amongst them said, "Suffer little children to come unto me." This special regard is only a consolation, if it be so, and not an explanation, for the tragedy. The problem still remains. The pious tell us that it is all the will of God. The Will of God! A child is a gift; it delights our hearts; it fills our minds with "bright dreams and fancyings strange," it touches the most spiritual chord in our bosoms, and raises even the most hardened sinners among parents to a pitch of altruism and love, otherwise impossible in such lives. And then, it is all dashed to pieces. If this were the Will of God, then He has forfeited all claims to human respect, not to speak of homage.

According to the law of transmigration, life is but the expression of accumulated desires. Its duration should, therefore, depend upon this accumulation. In the case of a child, the accumulation is so small that it is worked out in a very short time. When it is worked out, life must also cease, for there is no need for expression where there is nothing to express. Further, since the child does not have time enough to form fresh desires, it follows that it has no more necessity to return to the earth; it has attained salvation for ever. This explanation may not remove a parent's grief, but, by touching it with a reason, it may render it a little less poignant.

IN VINDICATION OF SYMBIOSIS

By H. REINHEIMER.

"Biology is in an unhealthy state." *Nature*, 3.11.23.

"The present state of biological philosophy is unsatisfactory." *Ibid*, 23.2.24.

It is a matter of no small importance to biological interpretation at this moment to emphasise the fundamental distinction between Symbiosis and parasitism. The practice of using the words as practically synonymous has done not a little to produce the present confused state of biology. Involved is, of course, the distinction between biological good and evil, the greatest stumbling block of science at the present time. Seeing that Symbiosis and parasitism have this in common that sometimes the parties are physically attached to each other, and that Symbiosis *sometimes* degenerates into parasitism, this is enough for many biologists to stigmatise Symbiosis as a form of parasitism. But, because health sometimes deteriorates into disease, it is not therefore synonymous with disease; and no more is Symbiosis synonymous with parasitism. There are a number of prominent biologists who affirm that Symbiosis inevitably ends in parasitism, and is, in fact, but a form of parasitism —a view that is as little warranted as is that which declares that health invariably ends in disease or involves disease. This view accords to Symbiosis but a tiny province in the vast empire of parasitism. The view which I am endeavouring to substitute gives the prominent position to Symbiosis and the subordinate position to parasitism. By Symbiosis I mean definite, I had almost said deliberate, mutual adaptation for the purposes of mutual service on the part of living things, nearly always of different orders of creation. By parasitism, on the contrary, I mean the antithesis of such reciprocity, namely, one-sided exploitation of organism by organism. By Symbiogenesis I mean the urge behind the plan of symbiotic co-evolution between plant and animal. Survival value, I submit, should be interpreted in terms of value to the plan and in conformity with the dominant idea behind it, to wit, co-operation. A typical paper, perpetuating what I would call the old error, is that by Dr. A. Herre on "Lichens—Impossible Plants" in the *Scientific Monthly*, February, 1923, which is well

worth examining with a view to vindicating Symbiosis and to clearing the terrain of prejudice. We are told that a lichen is not an organism or a species in the same sense as the word is used in reference to other plants or animals, since it is composed of two distinct and utterly unlike living organisms, that it is at most a physiological and not a morphological species. This is typical of the way in which some writers get rid of unpleasant facts. A morphologist has no room for "physiological" species, and so he dismisses them altogether. The assertion requires some hardihood in the case of plants which, as Dr. Herre himself admits, are of tremendous usefulness, so much so that they are practically indispensable to the world of life. According to the facts of Nature, it is not that lichens are impossible, it is rather that other plants are impossible, but for the presence of lichens, since they excel in pioneering, *i.e.*, they prepare the soil for other plants. The trouble is that the social factor in the origin of species has never been apprehended. Seeing that the organs of the individual body are, as is now better realised, quasi semi-independent organisms, which by their various forms of co-operation constitute the different species that exist, it is not so wonderful, after all, that sometimes primitive species, much dependent upon one another are found to coalesce, uniting their forces so as to form a new organism. Nature evidently has more than one way of making species. Nor, evidently, does she know the difference between physiology and morphology. Nor is it possible to conceive of a species which is purely morphological, and not also at the same time physiological. What is a species? Essentially an assemblage of life that holds fast to a certain physiological tradition, to a certain division of labour, internal and biological. The lichen is what it is as a result of inter-action. But so are other organisms, if we probe the matter sufficiently. Dr. Herre, however, is a morphological purist, who cannot see that in Nature unity is constituted by diversity. He fails to see that Nature works pre-eminently by inter-action, and that there is practically no limit to the achievements of co-operation, so long as it is fertile in results widely availing towards life. No species is produced, or even reproduced, by its own unaided resources, not even a coco-nut crab, as Dr. Herre seems to think. A species is what it is as the result of the support it can command from others.

By way of marking a contrast with the dual organism, which is the lichen, Dr. Herre tells us that it is impossible to have, say, a coco-nut crab, the parents of which were anything but coco-nut crabs. We might retort, however, that the coco-nut, as the essential food plant of the crab, has perhaps had more to do with the

making of the species than he imagines, and that in that important sense the coco-nut crab is a dual species, too. The important food partnership is there in each case though with different degrees of intimacy. Food exerts a quasi genetic influence upon the evolution of the species. It is merely a question of the kind of effect it yields in each case, and that, of course, depends also on the status of the organism. No one who contemplates for a moment the fact that we have two great divisions of animals in the world, in accordance with nutritive habits, the herbivora and the carnivora, can help seeing that the influence of food in the building up and in the transformation of species must be enormous. Both coco-nut crab and lichen are the result of Symbiosis, though at different rungs of evolution. It is merely the difference of status and the correspondingly different application of the identical principle which constitutes an external difference. This difference is not great enough to constitute the case of the lichen an " impossible " case ; and, if it be none the less an exception in a restricted, morphological sense, it is one which otherwise confirms the rule—the rule that legitimate socio-physiological interaction is the chief means of progressive evolutionary synthesis.

Growth is far from being the simple process, which it hitherto was thought to be ; and it is increasingly seen that it is the associative factor and, connected with it, the dietetic factor, which are important. Anatomists tell us that we must postulate a much more elaborate mechanism controlling developmental processes than any we have knowledge of as yet. This elaborate mechanism is required in view of the complexity of interaction and inter-dependence attained by organic life. It is necessary so as to render all developments true concomitants of inter-dependent progress, of Symbiogenesis.

The case of the lichen merely shows great intimacy and interaction in Symbiosis It represents a primitive case of Symbiosis, which, however, like sex, is capable of evolving. Symbiosis starts primitively with close association, with attachment of partners. With increasing gains, however, the partners may become separated, albeit carrying on reciprocity at a distance. In course of evolution, mutuality between plants and animals persisted. The two have become related to one another much as the sexes are related. They are one in reality, though separate in appearance. The Vitamins, which the plant alone knows how to manufacture, represent quasi-genetic ingredients of the food ; and the animal depends upon the plant much in the same way as the ovum depends on the germ. In either case there is replenishment of forces by specially tutored material. Whilst the plants specialised increasingly as producers

of carbohydrates and of oxygen, their partners amongst animals, bacteria, and fungi, relieved the plants by co-specialisations from many domestic duties, so as to render the gains of the plants again beneficial to them. In other words, plants and animals became socio-physiological partners, and jointly forged the links of progress. Evolution is largely based upon this fundamental fact. Bio-economically speaking, all animals are essentially plant-animals, and all plants are essentially animal-plants. As a general rule of life, the partnership between plants and animals is best carried on without physical attachment of partners. For it is better for the achievement of increased specialisation and of increased status, since reciprocity at a distance allows of a large measure of valuable independence—independence in fundamental inter-dependence. No doubt, it is because of these gains of evolution through a progressive use of the principle of inter-dependent independence that the differentiation between plants and animals first arose. Norm-Symbiosis, *i.e.*, the partnership between the " kingdoms " was not diminished but increased through the progress of differentiation.

It is not for a highly differentiated animal to fuse with its food-plant to an extent to which a lowly fungus may fuse with an unicellular alga.

The indispensability of the alga safeguards the algal element against undue fungal encroachments. Inasmuch as the alga is thus maintained, the case is a physiological (symbiotic) and not a pathological (parasitic) union.

Dr. Herre tells us: " If we section a lichen and examine its anatomy, we find it to be made up of a fungus and an alga. The form and texture of most lichens is due to the fungus, its hyphae or filaments often being compacted at the surface to form a thick strong cortex, while from the lower surface they extend as rhizoids or otherwise simulate roots. The alga on the other hand is nearly always distributed in a layer within the body of the lichen, but much nearer the upper or outer surface, so that in section it forms a streak of bright green enmeshed in the white threads of the fungus. In the gelatinous lichens, such as the *Collemaceae* and the *Ephebaceae* and a few other families, the shape or habit of growth of the lichen is due to the algal element, the fungus making up but a small part of the lichen."

This is as might be expected on the interpretation that I have so far placed on the case of the lichen. It is clear that it is possible for a primitive organism to form a tissue in another organism. According to the importance of the new tissue is its position and its permanence in the polity of the new organism formed. If

the contribution of the fungus is more important than that of the alga, then the polity takes the form of a fungus, or is at least dominated by the fungus. If the algal contribution is more important, then the form is that of an alga. The case of the gelatinous lichens shows that the fungus is by no means always predominant. We may take it that with increasing evolution in Lichen-Symbiosis the alga comes increasingly to be respected. The fact that the lichen may take on this or that form, according to dominance of this or that kind, means that morphogenesis, here as elsewhere, is not arbitrary, but is in accordance with socio-physiological factors. In the crab the animal predominates. Hence it is animal-like. In the coco-nut tree the plant predominates. Hence it is plant-like. In some lichens the fungus predominates. Hence they are fungus-like. In others the alga predominates. Hence they are alga-like. In each case there is something of the recessive partner element hidden below the appearance of the dominant.

We must remember that fungi form a tissue in thousands of cases of higher plants. Here, owing to the great difference of status, they cannot attain to anything like the dominance they frequently obtain in the lichen. The tree which they serve remains a tree. But it is none the less different for the presence of the fungi. Many fungi follow the adage " kannst du nicht selber ein Ganzes sein, so schliesse dich dienend an ein Ganzes an."

And if it be not a whole such as a tree with which union is to be effected, the fungus will often be satisfied to serve a half, such as an unicellular alga, the two constituting, perhaps an unusual plant, but still a plant to all intents and purposes.

But our morphologist is not so easily denied. He brings the whole power of his department to bear on the indictment of the lichen : " A more careful microscopic examination of the structure of a lichen shows that the algal cells are not only surrounded by fungal hyphae, but that the latter are closely appressed against the algae or even send haustoria into the algal cells, in either case drawing from them by osmosis elaborated foods and often destroying them."

In other words, the intimacy appears closer on microscopic than on ordinary vision. This is only in the fitness of things, and to be expected in a case of mutual dependence so close that it has taken naturalists centuries to discover that there is here a compound plant at all. Evidently there are haustoria and haustoria. What is in a name ? Frequently it may be a case of modified " haustoria," or the semblance of one, and the connecting link may be merely a symbiotic and not a parasitic one. Our morphologist himself

suggests that there is merely a "Maybe" about it. Were it a case of parasitism, it would mean a loss of evolution, whereas there is no loss in the case of the lichen, to judge by its achievements —of which more anon. The status of a higher animal implies a different degree of mutuality from that existing in the case of the lichen-forming fungus with its food plant. It implies a degree of mutuality adequate to the position of an evolved species. The great intimacy in the case of the lichen is compatible with the status of a little evolved species.

In the union between fungus and alga, forming the lichen, both partners furnish their share in the reproduction of the compound organism. In the interaction existing between plant and animal, again, both partners furnish a share in reproduction. But here, with higher status, and with a larger specific endowment, each partner provides a more distinctive share towards its separate reproduction than is the case in the fusion which constitutes the lichen. It is expedient, and, what is more, bio-economically sound, in the one case that the partners should be separated. It is expedient and right in the other that they should remain more closely allied. And reproduction has to shape accordingly in each case. The specific nature of highly evolved species is merely more pronounced than that of a little evolved species. Reliance upon partnership, on Symbiosis, however, is unavoidable here as there. Where would be the social states of the highly developed insects, if they could not rely upon the timely production and maturation of the quasi-genetic food material furnished them by their symbiotic food plants? The timely maturation of the nutrient material is almost as essential as that of the germinal in reproduction:

"Ein Bienchen kam und naschte fein,
Die muessen wohl fuer einander sein."

A peculiarity of the lichen consists in this that we have here a close union between a primitive plant, a fungus, which however, in many ways lives after the manner of the animal, and, on the other hand, a primitive plant, which, on the contrary, has retained the chief vegetable characteristics. The fungus is a partly degenerate plant, having lost the chlorophyll apparatus, and being inclined to draw parasitically on other organisms. If this constitutes the lichen a somewhat peculiar case, so far as its morphology is concerned, it is yet a case which illustrates strikingly the power of integration by the method of Symbiosis. It would be strange if two equally independent plants would proceed to symbiotic integration. If two such plants were to attempt the feat, they might, indeed, form what Dr. Herre has called "impossible plants."

They might be the purely morphological species to give satisfaction to specialists. Quite probably they would be akin to the artificial and lethal variations produced by Mendelians.

The case of the lichen-forming fungus is that of a converted parasite, becoming again a power for good instead of for evil :

" Es freut sich die Gottheit der reuigen Suender,
Unsterbliche heben verlorene Kinder
Mit feurigen Armen zum Himmel empor."

That there is so widespread a return from parasitism to reciprocal service in Nature, amounting to a reconversion to a legitimate life, speaks volumes for Symbiosis. It shows that Symbiosis, whatever form it may take, has the sanction of Nature to an eminent degree. Lichen-Symbiosis comes very near to being Norm-Symbiosis, at least in principle. An organism, which shuns self-supporting work, as a rule throws overboard restraint in matters of reproduction. It is well-known that many non-symbiotic fungi are veritable prodigies of reproduction. Instead of specialising in work, they indulge, as parasites, in redundant and pathological multiplication. The disease is cured when a working union with an alga takes the place of the erstwhile parasitism. With Symbiosis, redundancy is incompatible, as are theft and murder between the partners. Here the inordinate multiplication of the fungus has to stop in favour of hard work. Symbiosis is altogether the antidote to parasitism, its opposite pole. With a conversion from parasitism to Symbiosis, evil is turned to good. The fungal capacity for reproduction is, however, afforded some special scope. Often the fungus takes the upper hand in the joint reproduction of the lichen partners.

Surely this is not enough to base a general charge of parasitism upon the mere appearance of a connecting link. It is not probable that in the gelatinous lichens in which, as we are told, the shape and habit of growth are due to the alga, the alga is ill-used by the fungus. Yet on such flimsy evidence is based the charge of parasitism, and it is repeated *ad nauseam* by many otherwise first-rate biologists. In the same way it has been usual to brand the animal in general as a typical Cain ; and such assumptions pass unrebuked.

We are asked, in other words, to believe that health is the same as disease, because often it degenerates into disease. There is also the foolish view that dependence *per se* constitutes parasitism. But legitimate dependence is a good thing, in fact, the right thing. Only illegitimate dependence—one-sided exploitation of organism by organism—constitutes parasitism. The fungus gets plenty of good food from the alga. That we will readily believe. It is of

the very essence of Symbiosis that partners are thus supplied, provided that they will do their duties in reciprocity. There is nothing necessarily illegitimate or parasitic in an osmotic exchange of substances.

Let us see how our argument is further borne out by the very description furnished by our morphologist: "In ordinary fungi the vegetative part is usually reduced in size since it obtains its food already prepared, as when it lives as a saprophyte, or takes food from the host as it is manufactured, in the case of parasites. The fungus of a lichen, however, has the new duty of enveloping and protecting the alga so that the latter may increase in number and perform more effectively the task of manufacturing food for the fungus."

What do we find? The fungus of a lichen distinguishes itself well from an ordinary parasite. It changes its very form, and so as to become a protector. Instead of mere multiplication it exhibits growth—such growth as is legitimate and in accordance with progressive evolution. A parasite is no protector. On the contrary. It sets up disease. In parasitic relations, the exploitation is entirely one-sided and pathological in results. Could anything be more instructive than the facts that Dr. Herre sets before us? The fungus has its duties—the duties of a symbiotic tissue in the body—and actually fulfils them, not at all according to the demeanour of a parasite, which does the opposite from fulfilling duties, but in accordance with symbiotic rules, in accordance with the law of contract.

In Nature, as in human society, when two or several parties agree upon the same thing in the same sense for a consideration, this gives rise to rights and obligations. When these rights and obligations are respected, we have Symbiosis. It is of the essence of parasitism that rights and obligations are *not* respected. Hence as C. Bouglé, a French sociologist, puts it, "when an organism lives as a parasite on another, it is the weaker which triumphs and neither species is improved." The same writer states that it is all-important to recognise the fundamental bio-social aspect of life, and to do justice to what is due to the respective law, quite as much as to what is due to the mechanical aspects. Biological study, by itself, he thinks, is apt to mistake phenomena essentially economic, *i.e.*, voluntary and "historic" for "natural," *i.e.*, mechanical or involuntary. Our final point of view in biology must be a "historical" point of view, and economic phenomena must be envisaged not merely from technical but from juridical standpoints. Unless this is done "la morale naturaliste tombe

sous le reproche de n'introduire qu'au prix d'une inconséquence, la ' qualité ' qui lui est nécessaire pour hiérarchiser les êtres."

Dr. Herre's own showing leads us to infer that there is a pronounced distinction between a parasitic and a symbiotic fungus. The fact, too, that the form of the fungus is in accordance with its fulfilment of social duties, demonstrates *ad oculos* that, if the lichen be a physiological species, it is a morphological one none the less. Degeneration, such as that of a parasite, follows precisely upon non-fulfilment of social duties, as is shown by the case of cancer. Cancer cells are superior only in the power of setting at nought the co-operation of the body. Cancer cells have not acquired new powers, but, on the contrary, have lost fundamental properties of normal cells—that, for instance, of being governed by the bodily influences which regulate cell growth. In cancer we are dealing with essentially depraved modifications of epithelial, epidermic, or glandular structures, which have failed to be widely useful, and have instead turned malignant. Such malignancy is a negative factor, and only negative results could be expected from it. It has been found that in cases where fungi live in symbiotic relation with plants they present a very characteristic mode of growth, different from that adopted in a non-symbiotic relation. In the case of Orchid-cum-fungus Symbiosis, for instance, the hyphae of the fungus form very characteristic clusters, which are another example of the way in which Symbiosis promotes growth rather than mere reproduction. When the Orchids are in good condition, the fungus never forms spores, nor reproductive organs, in the tissues of the plants. It is only when we have conditions of morbidity that the temptation is provided for the fungus to give up its restraint and to reproduce instead of to grow. Much, therefore, depends on conditions, on " soil," on predisposition, on susceptibility ; and it is necessary that we know how to discriminate accordingly. The formation of clusters on the part of symbiotic fungi seems to have to do with the augmentation and perfection of mutual exchanges of useful substances. In lending itself to such exchanges, the fungus renders itself useful to the higher plants, much in the same way as the Agriculturist does in providing manure and other conditions in furtherance of his food plants.

Dr. Herre goes on to say : " A result of this is perhaps (!) the reason for the development of the greatly varied and complex bodies of the higher lichens." He should have said : as a result of this wonderful adaptation and co-adaptation to partnership, to Symbiosis, there is progressive physiological and morphological development among the lichens, such as is never witnessed among parasitic organisms. Evidently he pourtrays a picture of progres-

sive evolution in Symbiosis, the very opposite of evolution by parasitism, which leads nowhere, except to ruin.

Could anything be better calculated to stress the symbiotic character of the union of alga and fungus than Dr. Herre's continuation : " The fungus supplies the alga with water and mineral salts, and may also carry more or less of its carbon supply to it. The alga is protected in such a way that it is able to grow where it would be impossible to do so alone, and its continued existence, through cell division, is assured, though fission goes on slowly as a rule, while reproduction by zoospores is entirely inhibited."

Evidently there is in a most important sense a series of give and take between the partners, and the mutuality of the union is most pronounced—the very opposite of a parasitic relation. On the physiological and the bio-economic side the antithesis between Symbiosis and parasitism could not be more strongly marked. On the purely morphological side, too, it is pronounced enough when we reflect that in the tropics the lichens may rival the higher plants in appearance, a feat that no parasite could accomplish. Symbiosis, as stated above, means a restriction of reproduction in favour of work. It is, as I have pointed out more fully elsewhere, the source of morality in Nature. I have insisted on nothing more than that Symbiosis means service, and that service means austerity and moderation ; whilst to parasites there applies the dictum " idleness is the end of chastity." That an organism submits its nutritive and reproductive functions to a greater good—the good of a dual organism with its wide avail towards life such as the lichen—is essentially a mark of Symbiosis. So we find that the majority of plants have actually become secondarily hermaphrodites in order the better to serve in Norm-Symbiosis. Though not necessarily self-fertilising, they have re-united the sexes in one form, so as the better to function in Symbiosis with insect life. Slow but sure is the way of Symbiosis. Quick but unsafe that of parasitism. Symbiosis is the path of life. Parasitism that of death.

Let us consider again the case of the cancer cell with its inordinate " proliferation." It has recently been found that this ill-famed cell contains ready made, growth-stimulating substances, which other cells only provide when they are broken up. A tissue-culture, the growth of which is slow (normal) may be speeded up by the addition either of broken up ordinary cells, or by living cancer cells.

It has been said that the best definition of a body which is dying is that its growth no longer proceeds teleologically ; and that in an important sense is the case of all parasitic cells and even

organisms. That is to say, their growth proceeds irrespective of the common good of life. Growth is a concomitant of evolution. But with Symbiogenesis as the universal principle of evolution, growth of a kind became universal—such growth, namely, as was in conformity with the requirements of Norm-Symbiosis and with the metabolism prescribed by it. Parasitism is the denial of such normality. The reason of the disloyal behaviour of the cancer cells consists in the fact of the appearance in the blood of superabundant nutrition—the *raison d'être* of parasitism—which, so far from prompting to high forms of association and integration, lures the cells into the path of anarchism. Frequently the concomitant of cancer is a highly acid stomach. Now, normally the saliva of man is alkaline, whilst that of carnivores is acid, which shows that unsymbiotic feeding is on the path of death rather than on that of life. As a general rule, the reactions of living substances are alkaline, or neutral; but with death they usually change to acid. The whole tendency of cancer cells and of the stimulations which they are apt to impart to others, including that of rapid growth, is on the path of death, and so is everything connected with parasitism. Not until all this is duly comprehended will the position of the lichen be properly appreciated.

With almost incredible levity of thought, Dr. Herre proceeds to speak in terms of parasitism of the evidently symbiotic mutuality, which he has himself depicted: "It is self-evident that the algal host-cells, usually remote from the surface of the lichen, are in a much less favourable position for carrying on photosynthesis than when they are free. Sooner or later they are killed by parasitism or parasitism and saprophytism together."

What is self-evident is merely this that the *raison d'être* of the union is mutual serviceability. When this condition is no longer fulfilled, Symbiosis ceases to pay, and it comes to an end in one way or another. Failing partnership, warfare ensues in accordance with the Ruskinian saying that a thing is apt to become malignant when it ceases to avail towards life with all its strength. Prof. Noël Bernard has shown that there is a series of mutual adaptations between certain classes of Orchids and certain classes of fungi, many of which adaptations are precarious, because liable to violent fluctuations in point of mutual utility. According to him, some fungi are better prepared than others for a symbiotic life. As a class the fungi are inclined to saprophytism, *i.e.*, they have become confirmed "in-feeders," and these habits universally lead to an abnormal metabolism. Their ancestors were green plants and, hence, we may assume, were possessed of a certain degree of symbiotic disposition. This disposition has been largely lost

in the modern fungi, which are destitute of chlorophyll and, hence, unable to manufacture carbohydrates. They have thus come to resemble animals, or, at least, the colourless cells of higher plants in their mode of life. But even in degeneration the symbiotic sense is frequently not entirely defunct. It may be merely in abeyance, capable of some re-awakening on appropriate occasions. By reverting to the symbiotic usefulness of the colourless vegetable cells in ordinary higher plants—making a virtue of necessity—*e.g.*, when other means of gaining a livelihood are wanting, or when they are occasionally made to yield to the pressure of symbiotic momenta in the shape of prepotent "good" influences wielded by higher plants—the fungi may rehabilitate themselves to some extent as useful bio-economic agents. In this, too, they resemble the animal, which is frequently a plant-assassin, needing to be curbed in its destructive propensities by innumerable defences of the plants. In the light of this, the case of lichen partnership with its wonderful achievements, redounds to the credit of Symbiosis rather than detract from it. If we fail to realise that there are gradations in partnership, and if we mix up promiscuously good and bad cases, we shall arrive at no adequate appreciation of Symbiosis.

If Dr. Herre had paid sufficient attention to biological interaction, he could not possibly stultify many of his previous remarks by what follows. He avers that: "It is this strange association of two unlike organisms, a fungus as master living as a parasite or a saprophyte upon an enslaved alga, which gives rise to the anomalous organisms called lichens, plants which differ markedly from either of the components."

This is straining the idea of parasitism until it becomes the opposite, namely, co-operation, or Symbiosis. One might in the same way strain the idea of disease until it becomes health; and this is, indeed, what Prof. Bernard, an earlier student of Symbiosis, has done, anxious, as he was, to square the case of Orchidean Symbiosis with the current prejudices with regard to "immunity." According to him, "immunity" (and not health) is the alternative of parasitism. He compares the state of Symbiosis to a "benign form of disease," speaking even of "proximity to benign disease," which may be as near to perfect health as the Bank of England is to London. Dr. Herre is evidently animated by the common fallacy that dependence *per se* constitutes parasitism. In this he is merely copying the writer on parasitism in the *Encyclopaedia Britannica*, who argues as though dependence of organism upon organism with regard to food constitutes the prejudicial feature of parasitism, a view which would cause, as that writer himself

realised, almost all organisms to be classed as parasites, seeing that they are in one way or another dependent upon one another, which is absurd. For it is only illegitimate, *i.e.*, non-reciprocal dependence which imparts the taint of parasitism. The prejudice with regard to "dependence" is of a piece with that regarding the status of the animal. According to many orthodox writers, the animal is a typical Cain because unable to manufacture food for itself. But, as the case of Symbiosis shows, the animal may, and normally does, gain its food quite legitimately as a servant and partner of the plant—for "professional services rendered."

As was shown in my book on "Symbiosis," many secondary forms of Symbiosis are connected with disease merely inasmuch as the particular form of partnership is apt to impair a more important form of Symbiosis, one upon which health primarily depends. The great error is in treating as primary such secondary forms of Symbiosis.

Inasmuch as the fungus, as is clearly shown to be the case by Dr. Herre, supplies the alga with water and mineral salts, and perhaps also with carbon, the mutual relation is one entirely opposed to the principle of parasitism, which manifests no such mutuality. Moreover, two English investigators, Paulson and Somerville Hastings, were able to show that the algal cells produce their spores normally within the lichen. They never saw a single algal cell penetrated by a fungus thread. So in the case of the Italian rye-grass, where the fungus is associated with the seed, the latter is not in any way injured or prevented from germinating, as in the case of the oat grain when parasitised by smut or "slean." It was Schwendener who in 1867 established the dual character of the lichen organism. His discoveries were at first scouted by systematists, who, as Dr. Herre says, "could not bear to see their favourites deprived of their important rank"—a remark which shows the reluctance of biologists to recognise co-operation and also the kind of opposition that new ideas meet with in biology. The twofold nature of the lichen being now established beyond cavil, Dr. Herre admits that "most botanists have accepted the theory that the association of alga and fungus is one of symbiosis or mutual helpfulness." Yet he insists that it is a case of parasitism!

Look at the flimsiness of arguments by which our morphologist further seeks to brand the lichen as a parasite: "Here in the Philippines, as well as elsewhere in the tropics, we have remarkable and mutually beneficial associations between certain plants and ants, and in all parts of the world different kinds of animals or plants and animals dwell in relationships involving more or less mutual service. To merely list these would require a large amount

of space, and many instances of more or less perfect symbiosis will be found in any elementary text. But the writer fails to find parallel cases among the lichens and agrees with Bruce Fink that morphologically 'a lichen' is a fungus, usually, if not always, more or less parasitic during all or part of its life upon an algal host and also sustains a relation to an organic or inorganic substratum."

The "more or less" gives away the whole case for parasitism. "Usually more or less parasitic" in this case means: "sometimes the opposite of parasitic, namely, symbiotic." The argument of a biassed systematist, coupled as it is with the subsequent admission of ignorance regarding "the fungal relationship of many lichens," cannot be countenanced for a moment. It is difficult to see why Dr. Herre, who is so uncertain about most matters, will not give the lichen at least the benefit of a doubt. What is he looking for? If he really looks for a case of mutual helpfulness, as between plants and ants, surely the identical principle is there, although, owing to differences of status, the identity of form is not complete. Co-operation sometimes degenerates, even in those cases which our critic thinks are alone perfect instances of Symbiosis. It does so, for instance, in many cases of plant-animals, as was well shown by Prof. Keeble (*Plant-Animals*) where the (seasonal) Symbiosis terminates by the animal devouring the alga, the goose that laid the golden eggs. It seems, however, that algae, also, are none too reliable. Often they exhibit a morbid craving for nitrogenous food, *i.e.*, a tendency to "in-feeding." Hence frequently their choice is merely between seasonal Symbiosis with a lowly animal, or, in the alternative, more ingloriously, to be battening as scavengers on the offal of the sea, thus abandoning the ranks of strenuous life altogether.

Dr. Herre is too pedantic with his parallels. He wants a perfect resemblance on the morphological side. Is he not asking for too much? Although the fungi as a class may be said to live after the manner of the animal, we must not forget that they still occupy the status of a plant and, as such, cannot play quite the part of an animal, be it physiologically or morphologically. We should not expect more from the lichen than an imitation physiology, imitation morphology, imitation Norm-Symbiosis. If the lichen is to be regarded morphologically as a parasitic organism, because the morphological parallel between it (which is not a plant-animal) and a plant-animal does not appear pronounced enough; if Symbiosis is to be indicted because Mr. Bruce Fink has a prejudice that way, then we must demur. *Tant pis pour votre morphologie*! And when we hear of a fungus, which sustains a relation to an

inorganic substratum (which constitutes it a cross-feeder) we would hesitate *ipso facto* to prefer a charge of parasitism.

That everything is not plain sailing on the Herre-Finkian interpretation is evident from the further remarks of Dr. Herre : " It therefore follows automatically that lichens should not be treated as a separate class, but should be redistributed among the fungi by the systematist, thus doing away altogether with the class lichens. It is not at all likely that this will be done very soon as there are many difficulties in the way. Reproduction among lichens is peculiar ; we are ignorant of the fungal relationships of many lichens, while the interaction of alga and fungus has resulted in an organism and a mode of life which differ markedly from that of fungi, so that as a matter of convenience it is far easier to group lichens together than to have them scattered here and there among the fungi. These are some of the reasons why many botanists insist that lichens constitute a distinct class of fungi, if not indeed two."

After all, then, it is for weighty reasons more convenient to class the lichens as a separate group than to distribute them amongst the fungi. It is merely the prejudice of a few systematists that causes all this pother and delays the progress of science.

I have already stated that in the reproduction of the lichen the fungus frequently takes the upper hand. Yet this need not be interpreted as meaning that the fungus is master and parasite. As a matter of fact, the method of reproduction has to be increasingly suited to the dual nature of the plant, as Dr. Herre's own words bear out : " The fungal portion of ordinary lichens produces the characteristic fruiting body of the Discomycetes or Pyrenomycetes. The lichen fruit is known as an apothecium, and of course has no connection with and bears no relation to the algae within the lichen. Some lichens are not known in a fruiting condition, while in a great many others the fruit is either usually or else always imperfect or sterile, the asci or thecae never developing or forming spores. But many lichens do produce fertile spores which in time are thrown out to be distributed by the wind. Those alighting in favourable places readily germinate and in time may develop into lichens like the one from which they came, the hyphae enveloping the proper kind of algae from those growing on the substratum. However, it is doubtful if the majority of lichens ever grow from spores, even though they produce viable ones, but they propagate in an entirely different way. Upon the surface of the thallus of most lichens more or less minute powdery separable particles called soredia are formed, making up an amorphous powdery excrescence or a pustulat body termed a soredium. Each

individual soredium is composed of one or more algal cells characteristic of the particular lichens, entwined in lichen hyphae or fungal threads. Each soredium is therefore a microscopic bit of lichen thallus, and is a form of vegetative reproduction characteristic of these strange plants. As the soredia are set free they become widely distributed by the wind and soon make their appearance on all suitable exposed substrata where they develop into the characteristic form of the particular species from which they came.

While propagation by soredia may be compared to ordinary vegetative reproduction by bulbets, gemmae, budding, the breaking off of pieces of a mother plant or animal and other natural means, as well as by means of cuttings, it is only analogous and not homologous. Soredia are unique in that each minute speck or soredium includes two dissimilar organisms."

What do we find ? The preponderance of the would-be master, the would-be parasite is checked, as is also evident by the gradual discontinuation of the production of fungal fruiting bodies or spores, a method of reproduction which is dependent upon the accident of meeting with a suitable alga. Evidently, both partners are duly represented in the reproduction of the dual organism—an indication that Symbiosis has gained the victory completely over parasitism, and that sound economics have triumphed over unsound. The soredia are unique, particularly in that they typify the profound integrative effects of symbiotic association. It is clear that a profound co-operative, and not a parasitic, trait has become increasingly engrained upon the partnering forms, until co-operation became stamped upon the very protoplasm.

The soredia are young associations of algal cells, accompanied at an early stage by a few fungal hyphae, and jointly these go to form the new lichen organism. Reproduction, as I have stated before, depends upon biological support. The more reliable and far-reaching such support, the more possible it is to simplify reproductive elaboration in the more purely domestic sphere. Compensation in Nature knows no narrow frontiers, as was pointed out in my article on the subject in *Psyche*, January, 1923. In virtue of their intimate mutual support two lowly organisms such as an alga and a fungus may perpetuate themselves without much individual germinal elaboration. Biological provisions here may take the place of germinal provisions. What would be pathological atrophy in a non-symbiotic, is seen to be physiological and economically sound simplification in a symbiotic organism. Biological division of labour, biological compensation, may come in as substitutes for domestic, *i.e.*, more purely " physiological " division, according to the circumstances of each case, according to status.

Let us illustrate this truth by another instance. The more we take out of our cultivated food plants, the more will they " expect " that we by way of biological compensation relieve them of certain domestic duties, such as that, for instance, of the care of progeny, or the care of defence. Obliged to yield a maximum in certain directions, the plants feel inclined to reduce activities of propagation and defence, trusting for adequate compensation by partners. Compensation is universal, because co-operation is, first of all. Dr. Herre goes on to say : " It is not at all surprising that this comparatively recent method which absolutely ensures the continuation of the composite life should have so largely superseded the uncertain method inherited from the fungal ancestor, since the latter leaves too much to chance."

The case merely illustrates what other cases of Symbiosis show, namely, that a progressive evolution in partnership, in sound economics, is an eminent method of achieving success and survival. What has been superseded in the case of the lichen is the parasitic method of life, which usually depends upon chance—a method well worth superseding even at the cost of some (tainted) germ-plasm. Parasitism, the more pronounced it is, the more does it depend upon chance. A parasite finally becomes a mere automaton, losing all autonomy, orientation, and discrimination. Instead of determining the environment, as normal organisms do, at least to some extent, the parasite is, on the contrary, extremely determined by it. Out of a thousand eggs only one may find its suitable " soil," according to hazard. What good is the " germ-plasm " of such a species ? Things refuse to be mismanaged long.

There are other excellencies of the lichen, the recital of which ought to be enough in itself to dispose of the accusation of parasitism. In Dr. Herre's own words : " Their long life as compared to the ancestral fungi, their ability to persist through great climatic changes, their ability to endure successfully long periods of suspended activity and the formation of lichen acids which are not found in any other plants and are an excretion of the fungus all serve to mark them as a distinct group."

Evidently the lichens are physiologically younger and fitter than their fungal " ancestors." Longevity and power of resistance as I have always insisted, are essentially in the path of the symbiotic life, whilst physiological weakness, precariousness and curtailment of life are universally in that of parasitism. On this interpretation, the case of the lichen entirely rebuts the charge, frequently made, that Symbiosis is not even a safe compromise. Where else do we meet with a safer one ? Partnership is not always consistently pursued. But where else in life do we find perfect consistency ?

It is merely the high standard of integrity demanded by Symbiosis, which brings into greater contrast the inconsistencies that sometimes occur.

It is the mark of a parasite with its pseudo-prosperity to become increasingly fastidious as regards food, and, hence, to be precariously placed in Nature. The very opposite obtains amongst lichens, which, *qua* cross-feeders, have abundant supplies of the simplest food, not needing criminal excursions and yet most ideally fitted for pioneering work. Lichens are really at home in Nature in a manner in which parasites never are. We are told that " from a study of the lichen flora alone of a given region one may learn all the important facts of its climate."

Never could a parasite be such a useful general indicator of the environment. Again: " Lichens are, with trifling exceptions, perennial plants, and a majority are of relatively slow growth and long life. While some, especially the large foliaceous species of regions with mild, humid climate, grow with great rapidity, so that falling leaves and twigs are caught and embedded by their swiftly spreading tissues, others hardly change in appearance during the span of human life. Many of the common, inconspicuous crustaceous and foliaceous lichens become established and produce apothecia in from four to eight years, after which they may live for several times that before finally disappearing."

The whole character of the lichen may thus be said to be antithetical to that of a parasitic plant, which is generally characterised by rapid growth, by loss of chlorophyll, and by a short life.

From the remotest historical periods lichens have been valued and utilized by man. We are reminded that in the frozen regions of Lapland, Siberia, Alaska, and the Barren Ground the chief vegetation is constituted by a lichen called " reindeer moss," which is of the utmost economic importance to the inhabitants since reindeer, caribou, deer and cattle depend on it for food during the long winter. The Icelanders use " Iceland moss " in the same way.

In vain would one search the annals of natural history to find a parasitic organism that could boast of such a record of achievements, of such triumphs of utility. The charge of parasitism here seems preposterous. The same may be said of the *rôle* of the lichen as a pioneer, regarding which we are told: " It is in another capacity altogether that lichens are of the greatest importance, a field from which they will not be driven by advances in chemistry, and which they will occupy as long as the existing conditions of life endure. Lichens are the pioneers in breaking down rock surfaces and in preparing the way for higher plants. In the rainy tropics blue-green algae are the first to make their appearance

upon freshly exposed surfaces, but elsewhere lichens are supreme in this difficult and extremely important *rôle*. No rock is too hard or resistant for some kinds of lichens to attack. At first, attaching themselves at microscopic crevices, they secrete acids which dissolve certain constituents so that the rock slowly disintegrates, the rhizoids of the lichen ever penetrating deeper and deeper. Crustaceous lichens may be followed by foliaceous or fructicose species, and they are in turn accompanied or succeeded by certain hardy mosses. Later, the way is easy for ferns and herbaceous seed plants, and finally shrubs and trees to establish themselves. A few of the blue-green algae are able to live in the water of hot springs, but no aerial plants are able to compete with lichens in carrying on life under the most extreme conditions of heat or cold. On the stoniest of blizzard-swept Arctic tundras lichens grow over vast areas to the exclusion of other vegetation, while, as already shown, deserts and mountain peaks have them in abundance when all other plants are lacking."

What emerges again is this, that the lichens are of wide avail to life—as cross-feeders, be it noted. Certainly *qua* pioneers we must exonerate them from the accusation of parasitism. No such " difficult and extremely important *rôle* " could ever be discharged by a parasite. If systematists are unable to find a place for the lichens amongst plants, they should at any rate desist from classifying them amongst parasites.

The few lichens that live parasitically upon other plants may be said to be merely an exception, confirming the rule. What Dr. Herre has to tell us on this point contradicts his general accusation. " A few lichens are of importance because of the harm they do. Certain *Strigulas*, living on the evergreen leaves of tropical plants, are truly parasitic and damage somewhat coffee and other plants of economic importance."

Evidently they are only a few and such as have entirely failed in their mission. In other cases lichens may live epiphytically upon fruit trees. Dr. Herre, however, tells us that he does not believe that they are directly injurious, which shows that they have not developed the parasitic habit. Indirectly, such lichens may, however, become injurious by harbouring large quantities of more or less harmful insects. We must remember that we are dealing but with an imitation Norm-Symbiosis, that lichens are wind-fertilised, and that wind-fertilised plants are generally of lower status than insect fertilised. They have not known how to associate fruitfully with the higher insects; and there obtain instead associations of a lower and less desirable kind, which causes them at times to be indirectly harmful to more evolved plant

life. Nor can a lichen that lives epiphytically be a pioneer to the same extent as one that draws on the earth. An epiphytic habit is in danger of reaching the parasitic goal of existence. In proportion as the powers for good are on the wane in such a case, the powers for mischief usually increase. It is well known that many (wind-fertilised) weeds, apart from the direct injury they inflict upon cultivated plants, are objectionable, because of their liability to harbour and propagate disease. But what is it that often in the first place encourages the growth of the weeds? Temptation—a superabundant use of nitrogenous manures. Land that is well looked after is not a prolific breeding ground for valueless weeds. Hence, much always depends upon "conditions"; and it is not to be wondered at that some lichens under particular conditions of temptation are apt to lose in integrity. So long as they cannot be shown to be directly injurious—robbing other plants of food, air and light—the accusation cannot be sustained that they come under the category of useless plants.

Apart from a few exceptions, these lowly organisms are indeed unique in their widely availing usefulness, which more than outweighs what can be urged on the negative side of the account. They are so unique as perhaps to deserve a special place amongst plants, but surely a place of honour and not one of disrepute.

Dr. WATSON'S FIRST CODICIL

By ADELYNE MORE

The debate between Dr. J. B. Watson (the founder of Behaviourism in the sense in which it has become a subject of violent psychological controversy) and Professor William McDougall (who claimed to have inaugurated an earlier and saner Behaviourist movement) which formed so prominent a feature of the last issue of *Psyche* has had an interesting sequel. For in the September number of the American *Psychological Review* Dr. Watson explains that as a result of the debate it has become obvious to him that he has never really made clear the behaviourist's position on thinking. Thinking, with the behaviourist, must, he says, remain until the advent of experimentation " partly a logical formulation." By this he apparently means that though certain data can be obtained when the individual thinks aloud in overt terms, and additional material can be secured in late infancy and early childhood by observing the transition from overt talking to silent talking (' thinking '), many of its phases remain inaccessible to observation until instrumentation can be resorted to.

' Logically,' then, the behaviourist must formulate all psychological problems and their solution in terms of stimulus and response. He finds by experiment that word-organization takes place in early infancy at a very rapid rate. The process of word-building is found to be of the conditioned reflex type ; the subject is stimulated by an object, and simultaneously with the presentation of the object, the subject is stimulated by the word (spoken word, written word, touch word). The word, so far as the reaction is concerned can be substituted for the object. The individual thus becomes possessed of a word universe adequate in all particulars to call out all his organized reactions (*e.g.*, all his verbal and non-verbal habits). Since man is a verbal animal the word is reacted to many times more often than the object itself. The word organization becomes dominant over all other organization. The throat motor segment thus becomes the controlling segment of the body," as Dr. Watson showed in his earlier article (July, 1924) on " The Unverbalized in Human Behaviour."

We are reminded that the individual does manipulate his word universe just as he manipulates his universe of objects ; that

trial and error manipulations bring new adjustments in the word universe in the form of judgment, verbal conclusions, propositions and the like just as they bring new adjustments in the object field—inventions, discoveries, etc. Whence it follows that the individual can *plan* in words, day-dreams, dreams and the like just as he can arrange and rearrange the objects before him—idly, as in the decoration of a room, strumming on the piano ; or systematically, as when arranging the office furniture to admit of some new efficiency scheme. " The behaviourist has preferred to call all verbalization that goes on behind the closed door of the lips ' thinking,' regardless of whether new verbal adjustments are effected or only old habits rehearsed. The stimulus to this behaviour we call ' thinking ' is obviously on the one hand the world of objects, and on the other tissue changes in the body itself."

Dr. Watson proceeds to review the various stimuli to action. The most powerful, he thinks, are probably *stomach contractions*, when food is absent. The next most powerful, in the male at least, is the *pressure* stimulus leading to sex response. The third is the laryngeal (chest, etc.) motor contractions in the throat, of the *just previously spoken sentence ;* this stimulus initiates the next verbal reaction (or the next manual or emotional reaction). " In view of the fact that the hunger stimulus (contraction) and the sex stimuli (pressure, etc.) occur with relative infrequency, the laryngeal stimulus has the command of the individual's organization most of the time, except when in actual conflict with hunger and sex. Which set will become dominant when conflict occurs depends upon the parallelogram of (neuro-muscular) forces."

The question next arises : Do we think only in words, that is, in verbal motor contractions ?

Dr. Watson's answer has hitherto been : Yes, or in word substitutes, such as the shrug of the shoulders or other bodily response, found in eyelids, muscles of the eye or even in the retina (assuming, of course, that the ' image ' has been given up in psychology !) which exists in our organization as a conditioned reflex of the second and succeeding orders and put on later than the first conditioned response which is, theoretically at any rate, the word. These conditioned responses represent the abridging and short-circuiting process that goes on in all original learning.

But he is now inclined to " emphasize some points more or less neglected " in his 1920 paper before the International Congress for Psychology and Philosophy. His new formulation tries to take account of the fact that when the individual is thinking *the whole of his bodily organization is at work*—even though the final solution may be a spoken, written or sub-vocally expressed verbal formula-

tion. In other words, from the moment the thinking problem is set for the individual (by the situation he is in) activity is aroused that may lead to adjustment. " Sometimes the activity goes on in terms of (1) manual organization ; more frequently in terms of (2) verbal organization ; sometimes in terms of (3) visceral organization. That is, in the trial and error process towards solution sometimes (1) is dominant, sometimes (2) and sometimes (3). If (1) or (2) is dominant, progression (or possibly just ' activity ' is the better word) takes place *without words*."

On the basis of experimental work, he continues, after a diagrammatic excursion, it seems reasonable to adopt the position that emotional organization takes place exactly on a par with manual organization and laryngeal organization. " We have never needed any particular ' theory ' of manual organization nor of laryngeal organization. In the case of manual organization we have the observed fact that the newborn infant (and adults in new situations) slashes its arms and legs and trunk about. We have the observed fact that these unlearned acts later coalesce—become timed, spaced, regulated as to energy output (strength involved in each unit of the act). This process of organization we call habit formation. We have the observed fact that the infant has at birth a similar repertoire of unlearned vocal acts—cries, movements of mouth, throat and chest musculature, etc. Likewise we find that organization among those units takes place—word, phrase, and sentence habits are formed."

The only ' theory ' needed for all this is a reasonable physico-chemical hypothesis to account for the disappearance of movements not essential to the adjustment as a whole, since the essential elements of the movements required must be already a part of the individual's equipment.

But when we come to emotional organization we seem, says Dr. Watson, to need a theory. " The so-called James-Lange-Sergi theory has flourished for many years. Why, I have never been able to understand. Long before this theory became the customary psychological patter, primitive behaviourists in the Dark Ages rightly spoke of their heart, lungs, and bowels as the organs of emotional response. Apparently the sole contribution made by this group of authors was to say that the ' sensations ' arising from these viscera (when in action) are the emotions."

He therefore asks us to forget the James ' theory ' and go back to primitive common-sense. We have a great mass of unstriped muscles (neglecting for brevity's sake that some striped muscles are present)—in stomach, heart, lungs, diaphragm, blood vessels, glands, excretory, and sex organs. It would seem fair to call the

whole set viscera. "Could we not drop the concept of emotion and speak hereafter of *unlearned visceral behaviour* and *learned visceral behaviour* (visceral organization)? As unlearned visceral behaviour of the pattern type we would speak of heart-beats and circulation, respiration, defecation, urination, tumescence, peristalsis, stomach contraction, duct gland activity (salivary, etc.), ductless gland activity and *whatever else observations* show to be present. Likewise, in the whole viscereal mass we have less highly organized responses corresponding to the 'random' activity of arms, legs, and trunk of the vocal musculature."

It seems to him that there is evidence for the view that these ('random') visceral responses become organized into habit systems just as is the case with responses in the striped muscles. Professor K. S. Lashley has shown the presence of conditioned responses in the salivary glands; Pawlow and others in the stomach glands; others again have shown that the respiratory system and the heart system can be conditioned. The work on the so-called conditioned emotional reaction of Watson and Rayner probably falls in the same field as would the observations made by Kempf. Possibly even the sweat glands and the ductless glands show similar stages in habit formation.

Passing to every-day observation, Dr. Watson notes that infants can be trained in eliminative functions when they are from two to three weeks of age; our adult stomachs get trained to call for food at definite hours and for small or large amounts of food. Possibly sex gives us our best examples of visceral habit formation in learning to delay the orgasm. He is even inclined to think that jealousy is another highly organized built in (learned) bit of visceral behaviour. The extent to which efficient manual and laryngeal acts of skill are dependent upon suitable organization in the visceral field has never been sufficiently emphasized: "Probably as many drives have been spoiled on the tee by a slip in the intestine, a dry mouth, a bit of gas pressure, as by a bent knee or taking the eye from the ball."

But it is pointed out that just as we can never truthfully speak of behaviour being completely manual or completely laryngeal, so we can never speak of purely visceral behaviour. We do, however, speak of manual organization becoming 'dominant,' as when the individual is doing fancy riding on a bicycle; or dominantly laryngeal, as when a speaker is lecturing. Just so can we speak of visceral organization 'dominating' in sex, in fear reactions, in jealous exhibitions, blushing, etc. We can speak of both visceral and manual organization dominating in fighting;

of both visceral and laryngeal organization dominating in flirting,

With this justification of how visceral organization takes place Dr. Watson is prepared to admit its place (in minimal or subdued form) in the activity we call thinking.

Such is the first Codicil to the Behaviourist Testament, and it marks a welcome extension of the notion of Behaviour. If, however, Dr. Watson is really going to take account of the fact that *the whole bodily organization* is at work when " thinking " occurs, we may look forward to a series of further Codicils. And if such Codicils are added rapidly and diplomatically until the whole field of Introspection has been covered and all subjective reports interpreted, Behaviourism will continue to interest potential beneficiaries and to gain adherents in all branches of research which are concerned with the theory of knowledge. Otherwise the future lies with the first Eminent Neurologist who has sufficient knowledge of the jargon of psychology, and sufficient confidence in his own conclusions, to publish his Identification papers, and to assert that, whatever the language employed, all the psychologist can talk about is what he (the E. N.) and his physiological colleagues are already discussing from a different point of view.

EDUCABLE CAPACITY

By F. WATTS

The Report of the Consultative Committee appointed by the Board of Education to enquire into the value of Psychological Tests in so far as they may be useful to teachers and to those anxious to advise Boys and Girls about to enter the world of industry and commerce has just been issued.[1]

So much has been heard in the last few years of the claim to be able, by means of standardised tests to sort out individuals into definitely varying grades of capacity, that the attempt of the Consultative Committee of the Board of Education to estimate the value of this claim was well worth making. The Committee, of which Sir W. H. Hadow was the Chairman, examined many expert witnesses, read a great deal of literature collected for them, and subjected themselves to tests of different types. It is probably the first time that these tests have been thoroughly examined by a body of competent men and women in an entirely impartial manner without reference to the pressing needs of everyday practice, so that the conclusions reached should be of great interest not only to students but also to those engaged in the organisation of schools and of industrial or commercial works.

The Report opens with a lucidly informative account of the origin and subsequent history of the attempts to construct Psychological tests of various kinds. It may at once be said that no such exhaustive or accurate an account of recent work in this field of experiment has hitherto appeared. The reader who wishes to acquaint himself with the course of recent attempts to measure intelligence, to choose workers for particular branches of industry and commerce by Psychological methods, or to grade individuals in accordance with differences of temperament, cannot do better than refer to the first chapter of the Report which was prepared for the Committee by Professor Cyril Burt.

Attention may also be usefully drawn to the excellent short account of what is taking place in the principal foreign countries in the psychological selection of children for special courses of instruction and in the vocational guidance of young people who are leaving school. This section of the Report, which has been

[1] *Psychological Tests of Educable Capacity.* H.M. Stationery Office. 2/-.

specially prepared by the Secretary to the Committee, Mr. R. F. Young, though published as an appendix, contains much invaluable information which could have been gathered and put together only as the result of an unsparing energy.

With respect to the claim of the Psychologists to be able to grade children, and adults, too, in terms of intelligence, it is concluded that the science and practice of mental testing have successfully survived the first critical period of development, but that as yet they have by no means approached perfection, or realised to the full their manifest possibilities. Indeed, the need for caution has become increasingly evident.

The Committee state, however, with respect to tests of intelligence that there is general agreement as to their value for supplementing the present methods of estimating individual capacity, but that their value must inevitably be reduced so long as they are restricted by the limitations attaching to any system of examination which finally determines as low as the age of eleven the opportunities of children to proceed to places of higher education.

The Committee find, too, that certain tests of vocational aptitude have already reached a promising stage of development, and should prove to be of considerable service to parents and employers, and to public and private bodies engaged in recommending and training children and young persons for certain occupations, and still more, for discouraging children from entering occupations for which they are unsuited. But they also state that the range of such tests is not yet sufficient for any recommendation to be made for their immediate general application.

The discussion of the evidence upon which these important conclusions are based makes interesting reading, and we have no hesitation in recommending the whole Report for the consideration of those whose business it is to train children for various vocations open to them in the modern world.

FOREIGN INTELLIGENCE

ITALY.

[*Much uncertainty appears to prevail outside Italy as to the nature and status of modern Italian psychology. A brief account both of our institutions and publications may therefore be of value to readers of "Psyche" who follow the notes on current developments in these columns, or who may find themselves in Italy with an opportunity for personal research.*]

Psychological Institutes and Laboratories.

Perhaps in no other part of Europe are Universities so plentiful as in Italy. Most of them were founded in the Renaissance, and some even earlier. Each of the numerous Italian Dukes liked to have a own University near his Court, more famous and populous than that of its neighbours. From this rivalry between the different Italian Sovereigns of the Renaissance arose almost all the eighteen Universities that actually exist in Italy. But since the spiritual and cultural life of modern Italy is by no means as intense as it was in the Renaissance, and since on the other hand the financial capacity of Italy is very limited, many of these Universities have little more than a fictitious existence to-day, with two, or even one, faculty (generally that of jurisprudence), and with some 100–120 students and 12–15 professors. This happens especially in the cities, which had considerable importance in the Renaissance, but which have quite lost it since then ; as, for instance, Urbino, or Camerino, Siena, or Perugia. On the other hand, such an important modern centre as Milan has until this year been without a University, and the whole of Southern Italy had one University only, in Naples. For this reason during this year two new Universities were founded, one in Milan and one in Bari. If we add to these the two Catholic Universities in Rome and in Milan, the total number of Universities in Italy is 22, which is regarded as too many for a country with 38 millions of inhabitants. The abolition of some of these "Universities is therefore now projected.

Very few of these Universities have psychological laboratories and institutes of any importance. First comes the laboratory of Turin directed by Prof. Kiesow, and that in Rome directed by Prof. Sante De Sanctis. Then there are laboratories in Bologna, Naples, and Florence, directed respectively by Prof. Ferrari, Colucci, and De Sarlo. Particularly active and very well organised is the psychological laboratory of the Catholic University in Milan, directed by the late Padre Agostino Gemelli, an ex-pupil of Külpe, and one of the most eminent Italian psychologists of to-day. Even the Catholic University in Rome has its own little psychological laboratory.

The course of experimental psychology not being obligatory for the most part on students in philosophy, the laboratories are in general not much frequented. Students who follow only the general introductory course of psychology are admitted in the laboratories exclusively for the purpose of assisting at the demonstrations and experiments performed by the professor who directs the laboratory, or by his assistants. Only students, candidates who are preparing a " tesi di laurea," or Doctor's dissertation, in experimental psychology are admitted to manage by themselves such instruments as are necessary for their work. It is very seldom that in these laboratories more than one or two dissertations are done during the year. The whole teaching of psychology in Italy has a strictly experimental character.

Great interest for modern " psychotechnics " prevailed in Italy in the first years after the war, but it has now much diminished. It has, however, left its trace, especially in Milan, where a " School of experimental psychology " has been founded. This " School " is directed by Prof. Doniselli, and its principal aim is to determine in the school-boys of Milan their particular aptitudes for various professions. But it is still of too recent origin for us to be able to form a judgment as to its practical utility.

Psychological Reviews.

There are in Italy only two periodical Reviews devoted to psychology : the long-established *Rivista di Psicologia*, directed by Prof. G. C. Ferrari, and published by himself in Bologna, and the *Archivio di Psicologia*, edited by Prof. Kiesow in Turin. The latter has a strictly experimental character, whilst the first is particularly concerned with problems of the application of psychology to education, to psychiatry, to jurisprudence, and to the social sciences.

Single articles on psychology appear in Italian reviews of philosophy, pedagogy, and psychiatry ; especially in the *Rivista di Filosofia*, the official periodical of the " Italian Philosophic Society " ; in *Scientia* directed by Prof. Rignano (Milan) ; in the *Rivista di Pedagogia*, edited by Prof. Della Valle (Naples) ; and in the *Quaderni di Psichiatria*, edited by Prof. Morselli (Genoa).

C. STEPANOW.

AMERICA

Meetings.—What has been declared by many members as the most successful meeting the British Association has held within their memory, has just come to a close in Toronto. This meeting which will be reported more fully in *Psyche* at a later date was more or less international in character in that a number of American psychologists attended the meetings and read papers, in addition to the members from the British Isles and Canada, while the representatives from many countries to the International Mathematical Congress were occasionally seen at the sessions of section J. The elaborate arrangements for the convenience of the visiting scientists, the courtesy of the Toronto people, the entertainment at the Government House, and the festive atmosphere in general which

reigned during the convention week will be remembered for a long time by those who attended the gathering. As for section J., which was presided over by Prof. Wm. McDougall, the chief features were joint sessions with (a) section I on physiological and psychological factors of muscular efficiency in Industry ; (b) section L on tests for scholarships and promotions ; (c) with section H on Racial mental differences, a special meeting of the British Eugenics Society at which Prof. McDougall was the principal speaker, and another special meeting under the auspices of the Canadian Social Hygienic Council, at which in addition to Dr. Lydie Henry, several members of section J spoke. The presidential address delivered by Prof. McDougall was a plea to regard purposive striving as a fundamental category of psychology.

Academic Reorganisation.—The coming academic session will see many changes in psychological departments throughout the United States and Canada, affecting especially the larger institutions. The " Shake-up," as the American newspapers would call it, is perhaps in some measure a coincidence, but it indicates at the same time a landmark in the growth of psychology ; for such a redistribution of energy in academic psychology must necessarily result in increased activity. It is true that the Carnegie Institute of Technology has reduced its psychological department, practically eliminating all research problems, but the new biological institute at Yale University, whose psychological department will be in charge of Prof. Yerkes, formerly of Harvard and late of the National Research Council, and Prof. Dodge, of Wesleyan, more than counter-balances the loss at the Pittsburgh Institution. In a previous issue it has already been mentioned that Prof. Langfeld has left his post at Harvard to take charge of the new laboratory at Princeton University. Prof. Thurstone, formerly of the Carnegie Institute, has received a call to the University of Chicago, and Prof. C. S. Yoakum, of the same institute, will be professor of personnel management at the University Michigan School of Business Administration. Prof. R. H. Gault, of Northwestern University, will be associated with the National Research Council during the next academic year, and will give a course at George Washington University.

The news that Prof. Köhler, of the University of Berlin, is to give courses in the psychological department of Clark University during the next session is now followed by the report that another leader of the *Gestalt* School, viz., Prof. Koffka, of the University of Giessen, is to be the acting professor of Education at Cornell University and lecturer on the Jacob H. Schiff Foundation.

Columbia University has had a remarkable summer session with some of the leading British psychologists as lecturers.

Clark University.—Dr. Robert Hall, son of the late G. Stanley Hall, has presented the bulk of his father's large collection of books on psychology and philosophy to the psychological department of Clark University.

University of Iowa.—The following researches are now in progress at the University of Iowa :—

1. Learning curves of pre-school children.

2. A comparative study of the nature of the violin and voice vibrato as revealed by sound photography.
3. The Emotivity of the intellectually superior child.
4. An analysis of talent in the graphic arts.
5. The technique for the transcribing of Indian Music.
6. Effects of emotional stimuli on motor response in young children.
7. An experiment in the objective measurement of energy and industry as character traits in individuals.

CANADA.—Several changes have taken place in the psychological departments of the Canadian Universities. At McGill University the separation of psychology from philosophy has finally been achieved, and Prof. W. D. Tait has been appointed chairman of the new department, and Prof. E. Kellog, of Acadia College, has accepted an assistant professorship in Dr. Tait's department. The course in medical psychology at McGill University will be given by Prof. W. J. Bridges, who has left the University of Toronto to enter the services of the Canadian National Committee for Mental Hygiene. Prof. Humphrey, a graduate of Oxford and Harvard, and hitherto connected with Wesleyan University, is to teach at Queen's University.

Publications.—The first volume of a new translation of Helmholtz's *Physiological Optics* to appear in three volumes is out of press. An appendix to this monumental work is being written by Dr. Christine Ladd Franklin, of Columbia University, whose theory of colour vision is somewhat of a synthesis of both Helmholtz's and Hering's accounts. The publication of the *Physiological Optics* is being carried out by the American Optical Society.

A new series of books is being projected under the general title of "Human Engineering." This library will include works of a methodological nature in keeping with the new findings in physics, logic, and mathematics, especially as they affect the welfare of man and society. This series, which will be edited by Prof. R. D. Carmichael and Count Korzybski, is intended to cover the psychological sciences too, and at any rate to draw up a *rapprochement* between the physico-mathematical field and the psychological.

A. A. ROBACK.

CURRENT LITERATURE

The Seventh International Congress of Psychology. Proceedings and Papers. Edited by Dr. C. S. MYERS. (Cambridge University Press, 12/6.)

The most notable feature of the 1914 Oxford Congress was its social character, derived chiefly from the fact that psychologists here led the way to a resumption of international relations in science, and held the first really international gathering since 1914 under the genial Presidency of the Editor. Though this was doubtless not the reason which induced Dr. Myers to leave four of the papers in French and eight in German (an appeal to members at the Congress itself would surely have remedied this defect gratis), their presence in this inconvenient form at least emphasizes the fact.

The papers are of a highly miscellaneous character, and make it abundantly clear both that few psychologists have any logical training and that since " psychology " is now accepted as covering almost the whole field of philosophy and neurology, as well as human and animal behaviour, normal, morbid and industrial, unconscious and collective, including such subsidiary items as religion, education, symbolism, hen-pecking, and aesthetics, it should be recognized as the most important subject in University curricula.

The influence of psycho-analysis is notable in a variety of fields. Papers were read by Dr. Adler, Dr. William Brown, and Dr. MacCurdy ; while Dr. Ernest Jones and Dr. Abraham were amongst those who contributed to the discussions—which unfortunately do not figure in the present volume. Behaviourism is clearly responsible for many of the utterances of the American participants, who show a gratifying tendency to steer clear of metaphysical influences, even at the risk of occasionally overlooking the obvious. Their lack of dialectic subtlety was, however, amply compensated by the presence of a distinguished French contingent, while the structural syntheses of Professors Köhler and Koffka restore the balance on the philosophical side.

A. M.

Narcissus : An Anatomy of Clothes. By GERALD HEARD. (Kegan Paul, 2/6.)

There is a distinct psychological interest in the latest addition—also by a Cambridge scholar—to the convenient miniature series which J. B. S. Haldane's new classic *Daedalus* so successfully inaugurated. Mr. Heard both consciously adopts psychological hypotheses, and takes account of the mentality of the races whose

sartorial customs he here surveys with an almost Oxonian literary *hauteur*. "If," he says, "we may assume the psychological commonplace that the unperceived is *eo ipso* the vital, there can be no more striking example of it than the state of our clothes." And when we come to the rational dress of China, neither gravitational nor anatomical, we are told that the Chinese "are a people who seem born refined, reflective, recollective." The fetish of the little foot is foreign—"evidence of a racial memory not necessary of quadrupedness but of an approach from the back and a crouched attitude."

Obviously such a method is open to grave objections unless the psychology upon which the historian happens to rely be both acceptable on its own account and applicable to the situation in question. Mr. Heard, however, is not only on new ground, but he makes such suggestive use of his acquaintance both with the literature of Anthropology and with the development of Architecture that we shall be better advised to profit by his *aperçus* than to criticize what after all he is entitled to regard as mere decorative asides. On the Architectural features of the analogy which he outlines between the remoter and the nearer covering of man, Mr. Heard writes as one having authority, and throughout he is both concise and informative in an uncompromising style with distinctly Parisian affinities.

Another new volume in the same series is Professor Patten's *The Passing of the Phantoms*. As an Anatomist by profession, Professor Patten is naturally shocked not only by the superficial anti-evolutionist talk of the religious apologist, but by the neglect of the embryological evidence for "recapitulation" displayed by many of his scientific colleagues.

He therefore thinks it worth while to supplement this anatomical evidence for the theory of Evolution (which thirty years ago was familiar to everyone through the popular writings of Haeckel) by some first-hand observations on the educability and mental powers of animals, and on their possession of a "moral sense." By this means he hopes to be instrumental in destroying the Phantoms of Superstition, so that man may be recognised as, and even become, essentially and permanently a Rational Animal. That anything which makes for a return to the sanity of the eighties in these matters is desirable we are not prepared to deny, but it is perhaps a pity that in philosophical and ethical matters Professor Patten has been content to rely on the literature of the eighties. Apart from Huxley and Spencer his chief citations are from a railway administrator, who published a useful propaganda work in 1885 at the age of 75. Had he availed himself of the still more heretical contributions of the past half century to his central problem, he might not only have strengthened his case, but have touched on some of the difficulties which are agitating the younger generations of to-day. He might even have helped to dispose of some of the newer phantoms which have taken the place of those that haunt the minds of the doubtless vast public of elderly or uneducated persons to whom his frank little tract may nevertheless be helpful and disturbing.

P. M.

Sigmund Freud, His Personality, His Teaching, and His School, by F. WITTELS. (Allen & Unwin, 10/6.)

Though this book is and professes to be more than an indiscreet account of the domestic squabbles of the Psycho-analysts (Freud has described it as " not unduly indiscreet ") it is chiefly for its apparent indiscretions that it will probably be read by the outsider. Fritz Wittels was a minor light in the circle which from 1903 onwards gathered together weekly to elaborate, or to be used in the elaboration of, the Master's teachings. He left it in 1910, some two years before the split between Freud and Stekel, his present idol. Adler was ejected in 1911, and the breach with Jung occurred after the Munich Congress in 1913.

The narrative, therefore, is chiefly concerned with pre-war controversies, though later doctrinal developments are also recorded, and many unexpected sidelights are thrown on the chief personalities in the drama. That Freud should be annoyed by Stekel's slap-dash semi-journalistic methods, that he should fail to digest Adler's fundamental contribution, that he should be suspicious of Jung's religious leanings—all this need cause no surprise. It is even remarkable that as pioneer and leader of such a movement he should have kept his wayward forces united for so long, and, with such a notable ignorance of aesthetic and philosophical problems, should have so successfully captured the imagination not only of his own countrymen, but of the whole world. There is good reason to believe that his name may go down to history with those of Galileo, Newton, Darwin, and Einstein ; and that is the chief justification for the gossip of a disgruntled Boswell.

It is interesting to learn that Freud regards the nationalist idea as " a good antidote to the sense of inferiority." For many, many years, now, he has been a member of the Jewish Freemasons' Lodge Bene Brith. We are also informed that the Adler secession involved a wholesale Social Democratic withdrawal ; and that of late years " the orthodox Freudians have been busily engaged in reconstructing the theory of perversions and neuroses upon the basic conception of the castration anxiety (Oedipus complex + castration.)"

The author himself poses as the plain man humbly adopting the *via media.* It is therefore interesting to find him dealing as follows professionally with men who admire especially beautiful women. When such an one comes to him and confesses this predilection, " I then say to the patient : ' What you want is that these women should please, not only yourself, but also another man, one with whom you are in love, though perhaps without knowing it.' " And the analysis, so we are assured, invariably proves him to be right. It remains only to add that the translators, Eden and Cedar Paul, are to be congratulated on their share in a decidedly instructive chapter of psychological history.

P. P. M.

A Neglected Complex. By W. R. BOUSFIELD, K.C., F.R.S. (Kegan Paul, 4/6.)

Mr. Bousfield believes that " the mind has existence apart from the material brain " (p. 9), apparently because of Dr. Henry Head's

recent work on Aphasia. He uses " the term *psyche* to denote that which survives when the soma disintegrates " (p. 114), and he uses the word *amor* for " those highest manifestations of love which experience tells us are independent of somatic or erotic impulses " (p. 63). Those who are unable to accept this view, or vocabulary, are described as materialists. Freud is such an one ; and he suffers from the Materialistic Complex, a pathological condition resulting from " a conflict in which the idea of moral responsibility becomes painful and is repressed." Religious opponents of the Viennese school have often set forth their reasons for disagreement with the conclusions of that school, but this is the first time that they have adopted the Freudian theory of complexes in order to emphasize the disagreement. It is a legitimate controversial method, but we doubt whether the majority of those who might sympathise with Mr. Bousfield would find it an altogether congenial one.

C. K. O.

Kant's Treatment of Causality, by A. C. EWING, D.Phil. (Kegan Paul, 10/6.)

In the present state of the interpretation of Kant, any work which undertakes a careful study of the details of Kantian thought is welcome to those who are still attracted by the Critical Philosophy. With the richness of Kantian bibliography and the many available sources of information, judicious research may add considerably to our knowledge. Dr. Ewing, however, is not content merely with the role of an historian. He endeavours to clarify our ideas on the subject as a whole and to revive the Kantian theory, and to follow it to the supreme point to which Kant took it, namely, to the problem of freedom.

He adopts the view that synthesis is a " logical implication," and is much concerned to free Kantian doctrine from all special philosophies—to render it *neutral*. Transcendental deduction proved the necessity of a universal connection among phenomena ; the second analogy, the examination of which constitutes the chief object of the book, explains the necessity and the universality of this connection. According to the author, the connection between two events which follow each other is necessary and not reversible, and he adds that this is all that Kant succeeded in proving. The Kantian theory of causality implies no view regarding the relation between cause and effect. Kantian causality is a necessary succession, but not a dynamism nor a mechanism ; it is not concerned with the *internal* relation between cause and effect. Again the author wants to render the Kantian theory neutral by trying to prove that on one hand it implies no kind of idealism—not even that of Kant—and on the other hand that it agrees with realism.

Dr. Ewing proceeds to fill in the gaps in Kantian theory. He urges first that the categories in general, and especially causality, can be applied to the empirical self (which Kant denied) ; and, secondly, that there is an internal relation between the terms of the causal series, so that these terms form an organic whole, and that cause and effect are rationally inseparable.

By the latter contention the distance between *cause* and *ground* is lessened, even between phenomenon and noumenon. The

noumena will be no more above the phenomena, but among them, the ground will complete the cause and perfect the intelligibility of the causal series. But this implies a transformation of the Kantian theory of freedom.

Dr. Ewing thus shrinks from the Kantian interpretation of causality, and claims to have found a way of escape from the antinomy on one hand and the Kantian solution of it on the other. Freedom will then involve no breach in the universal necessity of succession, and we shall not be obliged to relegate it to a transcendental world: cause involves a *ground* which is akin to it; morality will be applied to a real self which, as a *real being*, yields to causality, but which, by its principle of unity, *i.e.*, *character*, frees itself from causality. Moral action being attributed to character, the self is free, even in the real world.

The scope of the work is wider than its title suggests, though as a general inquiry into the nature of causality it will not bear comparison with M. Léon Brunschwieg's *l'Expérience humaine et la Causalité Physique*, 1922.

And as Kantian exegesis the work is also open to objection. The author largely remains faithful to the traditional interpretation, or rather to the traditional defects of the interpretation of Kant. He admits without criticism Vaihinger's "principle of the scattered notes," according which the *Critique of Pure Reason* was composed at various times, and is therefore often contradictory; he also admits the existence, in the transcendental deduction, of a subjective, psychological, and therefore irrelevant, element. These, and similar views cannot, however, in the opinion of the present writer, be thus accepted without analysis; though the author, who is a fine Kantian scholar, puts forward many suggestive views. Moreover, Dr. Ewing always proceeds as a logician, *i.e.*, he reduces Kant's thought to a skeleton as simple as possible, and then he criticises this skeleton as he would a syllogism. This method may be excellent on occasion, but it is often responsible for the degeneration of criticism into dialectics—in the bad sense of the word. All this, however, does not detract from the value of Dr. Ewing's work to the historian, and one must admire the courage with which he tackles in under 250 pages so many difficult questions.

G. P.

Plato und die sogenannten Pythagoreer. By E. FRANK. (Niemeyer; 8 marks paper, 10 marks bound).

This important contribution to the history of Greek thought deals with a problem of which classical scholars have long fought shy. An interest in music, astronomy and mathematics is seldom combined with a capacity for dealing with textual and documentary evidence, though in this country Professors Burnet and Taylor, as well as Mr. F. M. Cornford, have shown what such a combination can achieve. Herr Frank cites the German translation of Burnet's *Early Greek Philosophy*, but he seems to be unaware both of Taylor's *Varia Socratica* and also of Cornford's work. Indeed, there is no evidence that he is familiar at first hand with any of the relevant English literature, though he cites Robin in the original.

His work, however, largely breaks fresh ground, and is concerned to determine the relations between Plato's theories of music, astronomy and mathematics with those of the "so-called" Pythagoreans mentioned by Aristotle. He does not pursue the subject beyond Aristotle, apart from sources of information, nor does he concern himself with the alleged system of Pythagoras or the still more nebulous mysteries of Orphism. The result is invaluable to those who would attain an insight into the scientific outlook of the educated Greek of Plato's time, and in particular no student of the history of Music can afford to neglect it.

The study of Platonism from a new angle has also given rise to Dr. D. S. Mackay's (privately printed) thesis on *Mind in the Parmenides*. The author is Instructor in Philosophy in the University, and unlike Herr Frank he is liberal in his references to modern interpretations of the theory of Ideas. Indeed, he goes so far as to assert that the historical interpretation of a document, conceived as the literal recovery of its initial meaning is an anomaly: "the meaning of a document is realised in the history of its interpretation." He passes in review the rival hypotheses from Schleiermacher to Taylor and Shorey, and he concludes that Plato had no definite theory of Ideas (p. 20), and that the Parmenides is rather "a discussion of the structure of mind revealed in the method of dialectic" (p. 87). If this were indeed the case; if we are really concerned in the Parmenides with a "logical" problem—"the logical import of a judgment in its relation to the particular subject-matter defined"—the psychologist may be content to stand aside and leave the field to the "logicians." But after reading Dr. Mackay's analysis he is more likely to profit thereby with a view to precipitating himself once more into their midst.

T. L.

Problems of Life. By L. TROTSKY. (Methuen, 2/6.)

America's Don Quixote. By L. P. LOCHNER, with a Preface by MAXIM GORKI. (Kegan Paul, 10/6.)

Not long ago the present reviewer proposed to add to volumes bearing the title *The Good, The Beautiful*, etc., a study devoted entirely to *The Silly;* whether or no it be an objective entity, and how in either case it may be recognised and avoided. But in spite of their wide experience publishers do not always see eye to eye with authors when a matter of £100 has to be lost in a good cause, and *The Silly* still remains in a state of projection. When it materializes both the present works will certainly contribute to swell its size.

Here are two of the Titans of the modern world. The one, after a rise from obscurity more dramatic even than that of Napoleon, has ostentatiously pulled down the most formidable Imperial organization of modern times, has been largely instrumental in destroying a second, and is proposing with its own finances to destroy a third. The other, from equally unpromising beginnings has become the richest man of all times. In 1915 both determined

to stop the World-war. The first, with neither money nor influence, gathered together a handful of outcasts in a café and issued some leaflets. Could anything be sillier, had he but realised what those who were in the know could have told him? The second, with millions at his back and Presidents and Secretaries of State for his friends, personally embarked in a small ship and set out across the Atlantic amid the derisive laughter of two continents. It might have been difficult at the time to suggest any sillier way for a multi-millionaire to occupy his time. In practice things are not done like that, as any academic visionary could have told him.

And to-day? After seven years to all intents and purposes on the throne of the Czar, Trotsky (who by the way appears as Trotzky except on the cover) issues a small booklet to say that after all nothing much can be done without a little elementary Psychology: "We must institute a Library in which we must collect everything we possess relating to the customs of every-day life—classic works on the evolution of the family and popular writings on the history of custom. . . . We ought to translate from foreign languages anything of value that has appeared on the subject in recent years." How silly for the Military Dictator of All the Russias to be carrying on thus. All the back volumes of *Psyche* to the translated into Russian! In another month or two he may even be urging the Red Army to become subscribers. Meanwhile Henry Ford has just turned out his 10,000,000th Car, has worsted Wall Street in a battle royal, and is apparently about to set up business on a large scale in England. In this way he believes the world is being made happier.

Clearly there is abundant matter of psychological interest in these two works, both of which have fine frontispiece portraits, while the story of the Peace Ship contains a number of other illustrations. Incidentally Mr. Lochner, who was Secretary to the Expedition, offers us a psychological analysis of his Chief. "In no other person have I observed so pronounced a dual nature," he writes. "The natural Henry Ford is the warm, impulsive, idealistic 'old man,' as the younger men with whom he prefers to surround himself fondly call him. The other Henry Ford has been inspired by the artificialities of modern civilization, by his environment, his business associates, his responsibilities, to the huge Ford interests." The book might appropriately have been dedicated to Morton Prince. C. M.

The Mysterious Medium. By SYDNEY A. MOSELEY. (Stanley PAUL, 5/-.)

Readers interested in the problems of Psychical Research must not be misled by the jacket in which its publishers have seen fit to clothe this account of various séances already widely discussed in the press, and which would be more suitable for a novel on Opium Dens by Mr. Aleister Crawley. Mr. Moseley is chiefly concerned to show how readily Sir Arthur Conan Doyle and his friends can be deceived by expert tricksters, and the story of the sittings which he organized for this purpose and the controversies to which they gave rise is both instructive and entertaining. In spite of his experiences on these occasions, however,

Mr. Moseley is himself " afraid to turn down Spiritualism in case it may be a fact." He tells us that he is at present writing a work with the encouragement of a lady journalist who is still occupied in the spirit world on " the work in which she was passionately interested here." Lord Northcliffe, his late secretary has just assured us, with the approval and support of Sir Oliver Lodge, is also there and still at it. Nevertheless, we look forward with genuine interest to Mr. Moseley's next book. K. D.

Forthcoming Publications.

Psychologists interested in Squint and Left-handedness will be glad to learn that Dr. W. S. Inman's conclusions on the subject of Eye Symptoms are to appear as an additional Chapter in Dr. Millais Culpin's *The Nervous Patient*, shortly to be published by H. K. Lewis and Co.

The autumn additions to the "International Library of Psychology" will include volumes by several contributors to *Psyche*. Professor Koffka's *Growth of the Mind* is a brilliant application of the structural view, and a useful companion to Köhler's *Mentality of Apes* which is also in the press. Mr. I. A. Richards' *Principles of Literary Criticism* is a development of various essays which first saw the light in these columns. Mr. E. J. Dingwall provides an Introduction to Tischner's *Telepathy and Clairvoyance*, and Professor Revesz has prepared an English edition of his Psychology of a Musical Prodigy. Messrs. Kegan Paul also announce Rohde's *Psyche* for early publication.

Freud's *Collected Papers* are soon to appear in English in four volumes through the Hogarth Press. Vols I and II are due in November, and will contain the early papers and the History of the Psycho-analytic Movement, and Papers on the Instinct and the Unconscious. The same publishers are responsible for Mr. Roger Fry's pamphlet *The Artist and Psycho-analysis*, in which the more reprehensible features of Freudian incursions into Aesthetics are amusingly, though not very profoundly, castigated.